DENGUE FEVER

Four serotypes

DEN-1
DEN-2
DEN-3
DEN-4

Genotypes/subtypes

DEN-1	3
DEN-2	2
DEN-3	4
DEN-4	4

The clinical course of illness passes through the following three phases:

- Febrile phase
- Critical phase
- Convalescent phase

Clinical Criteria for DF and DHF (1)

Dengue Fever:

An acute febrile illness of 2-7 days duration with two or more of the following manifestations:

Headache, retro-orbital pain, myalgia, arthralgia, rash, hemorrhagic manifestations

Dengue Hemorrhagic Fever (DHF)

a) A case with clinical criteria of dengue Fever

b) Hemorrhagic tendencies evidenced by **one or more of the following**

- Positive tourniquet test
- Petechiae, ecchymoses or purpura

- Bleeding from mucosa, gastrointestinal tract, injection sites or other sites

c) Thrombocytopenia (<100 000 cells per cumm)

d)

- A rise in average haematocrit for age and sex ≥20%
- A more than 20% drop in hematocrit following volume replacement treatment compared to baseline
- Signs like pleural effusion, ascites, hypoproteinemia

Dengue Shock Syndrome (DSS)

All the above criteria for DHF + rapid and weak pulse and narrow pulse pressure (≤20 mm Hg) or hypotension for age, cold and clammy skin and restlessness.

Expanded Dengue Syndrome (EDS)

- Mild or Severe organ involvement may be found in DF/DHF. Unusual manifestations of DF/DHF are commonly associated with co-morbidities and with various other co-infections. Clinical manifestations observed in EDS are as follows:

System	Unusual or atypical manifestations
CNS involvement	Encephalopathy, encephalitis, febrile seizures, I/C bleed
G. I. involvement	Acute Hepatitis / fulminant hepatic failure, cholecystitis, cholangitis acute pancreatitis
Renal involvement	Acute renal failure, hemolytic uremic syndrome, acute tubular necrosis
Cardiac involvement	Cardiac arrhythmia, cardiomyopathy, myocarditis, pericardial effusion
Respiratory	Pulmonary oedema, ARDS, pulmonary hemorrhage. pleural effusion
Eye	Conjunctival bleed, macular hemorrhage,visual impairment, Optic neuritis

Case Definition

- Two types of cases : Probable and Confirmed cases

Probable Dengue Fever

A case compatible with clinical description (Clinical Criteria) of Dengue Fever.

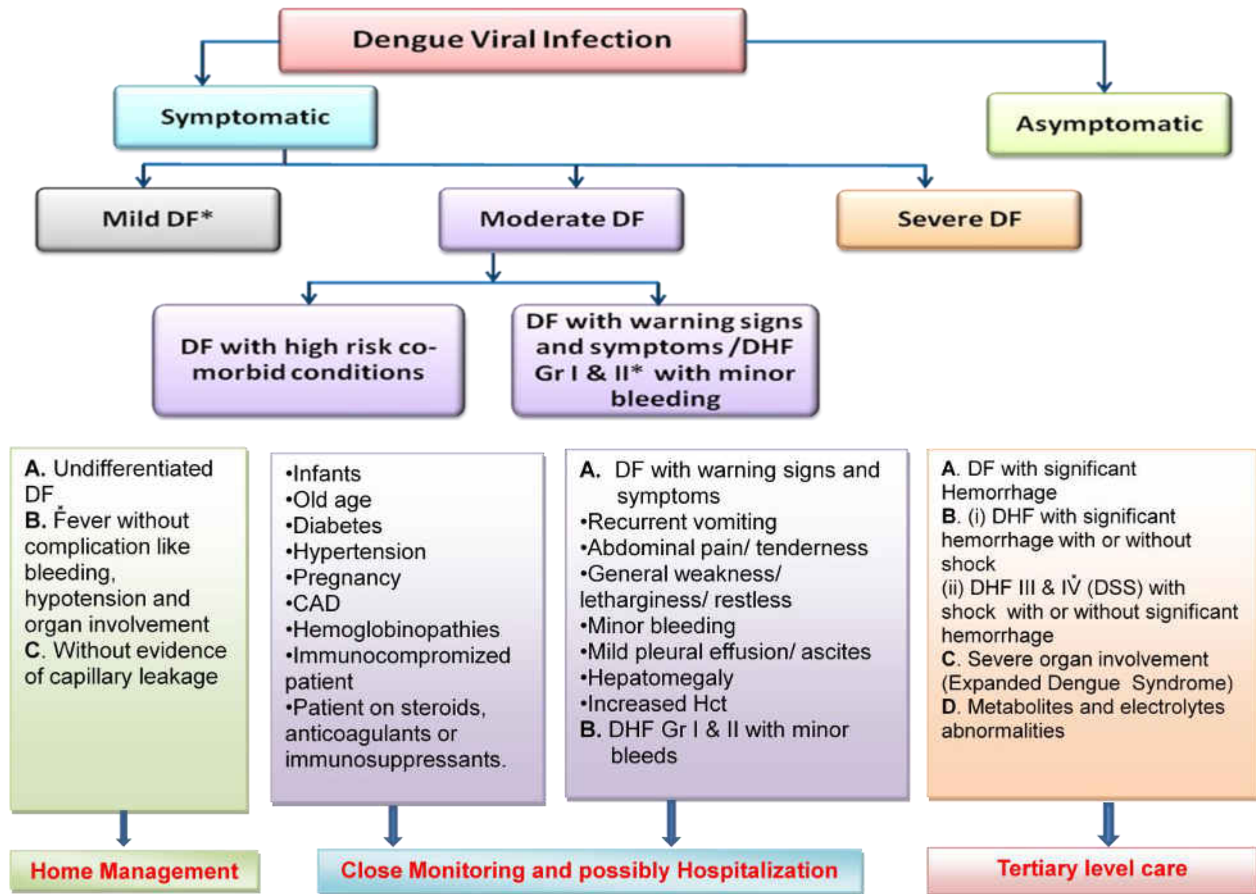
(*A positive test by RDT will be considered as probable due to poor sensitivity and specificity of currently available RDTs*.)

Confirmed Dengue Fever

A case compatible with the clinical description of Dengue Fever with at least one of the following:

- Isolation of the Dengue virus (Virus culture +VE) from serum, plasma, leucocytes.
- Demonstration of IgM antibody titre by ELISA positive in single serum sample.
- Demonstration of Dengue virus antigen in serum sample by NS1-ELISA.
- IgG sero-conversion in paired sera after 2 weeks with four fold increase of IgG titre.
- Detection of virus by polymerase chain reaction (PCR).

Dengue Case Classification



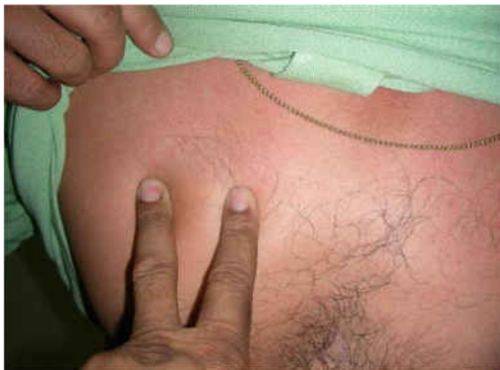
Lab investigations for diagnosis & confirmation

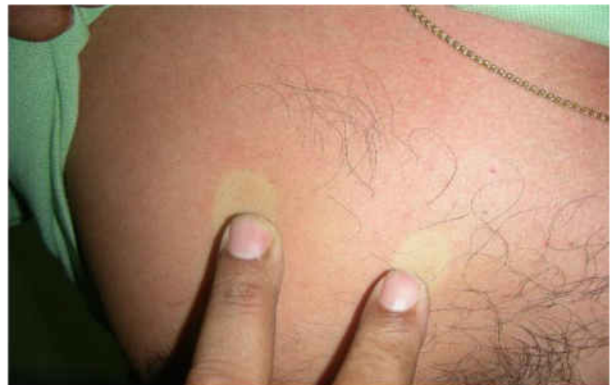
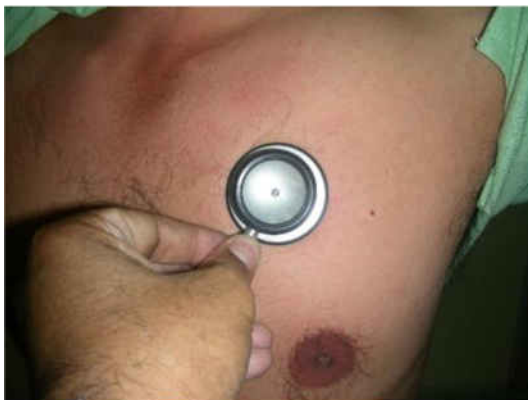
- NS1 ELISA test to be done on patient reporting during 1st five days of fever
- Serology to be done on or after day 5 by Mac ELISA

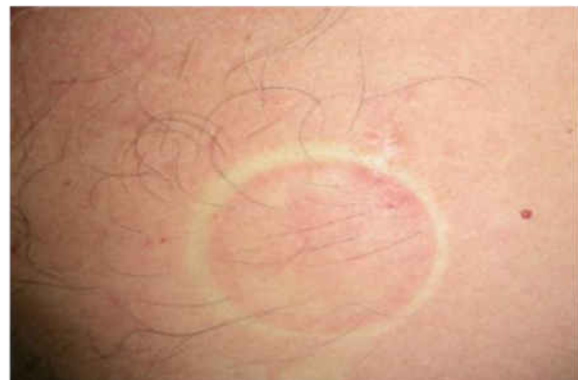
RDT

- -high rate of false positive compared to standard tests, while few are close to standard tests.
- - sensitivity and specificity of some RDTs also found to vary from batch to batch.
- Hence, a RDT positive case will be considered as probable case

Impression Signs of Dengue





Treatment of Dengue Fever & DHF I & II

- Fluids
- Rest
- Antipyretics (avoid aspirin and non-steroidal anti-inflammatory drugs)
- Monitor blood pressure, hematocrit, platelet count, level of consciousness

Treatment of DHF III & IV

All above treatment +

– In case of severe bleeding, give fresh whole blood 20 ml/kg as a bolus

– Give platelet rich plasma transfusion only when platelet counts are below 5,000–10,000/ mm3 .

– After blood transfusion, continue fluid therapy at 10 ml/kg/h and reduce it stepwise to bring it down to 3 ml/kg/h and maintain it for 24-48 hrs

Chart 1. volume replacement algorithm for patients with moderate Dengue Fever (DHF grades I & II)

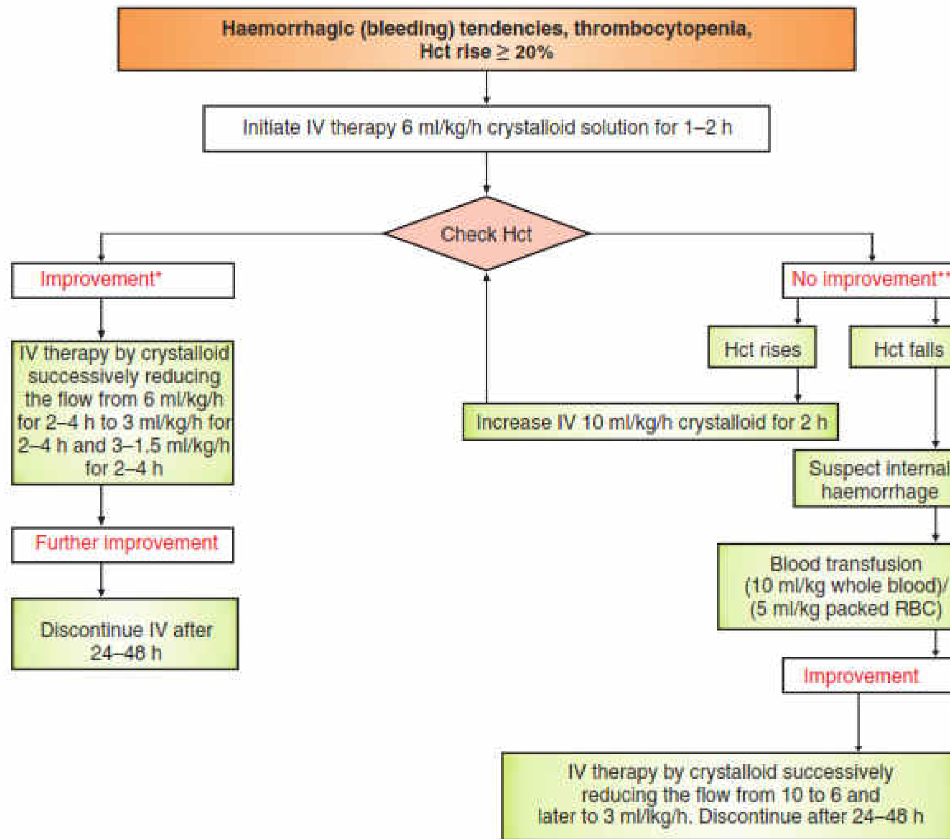
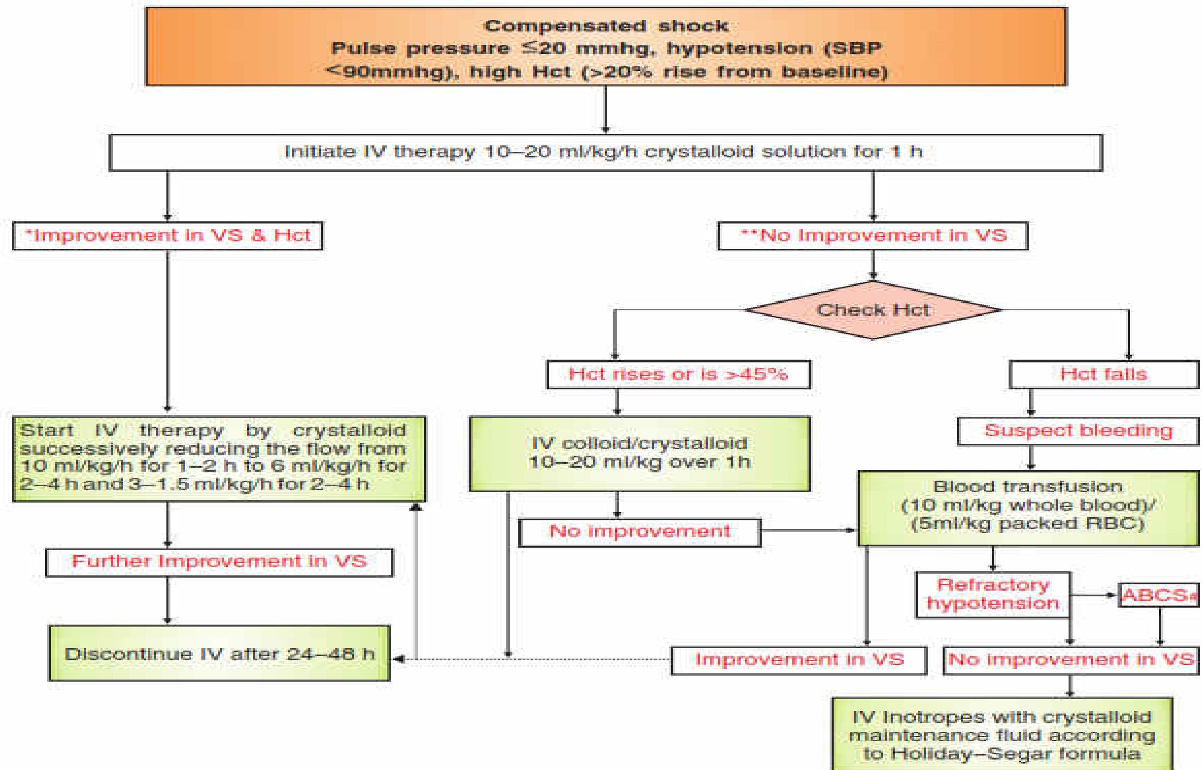


Chart 2. Volume replacement algorithm for patients with Severe Dengue Fever (DHF grades III)

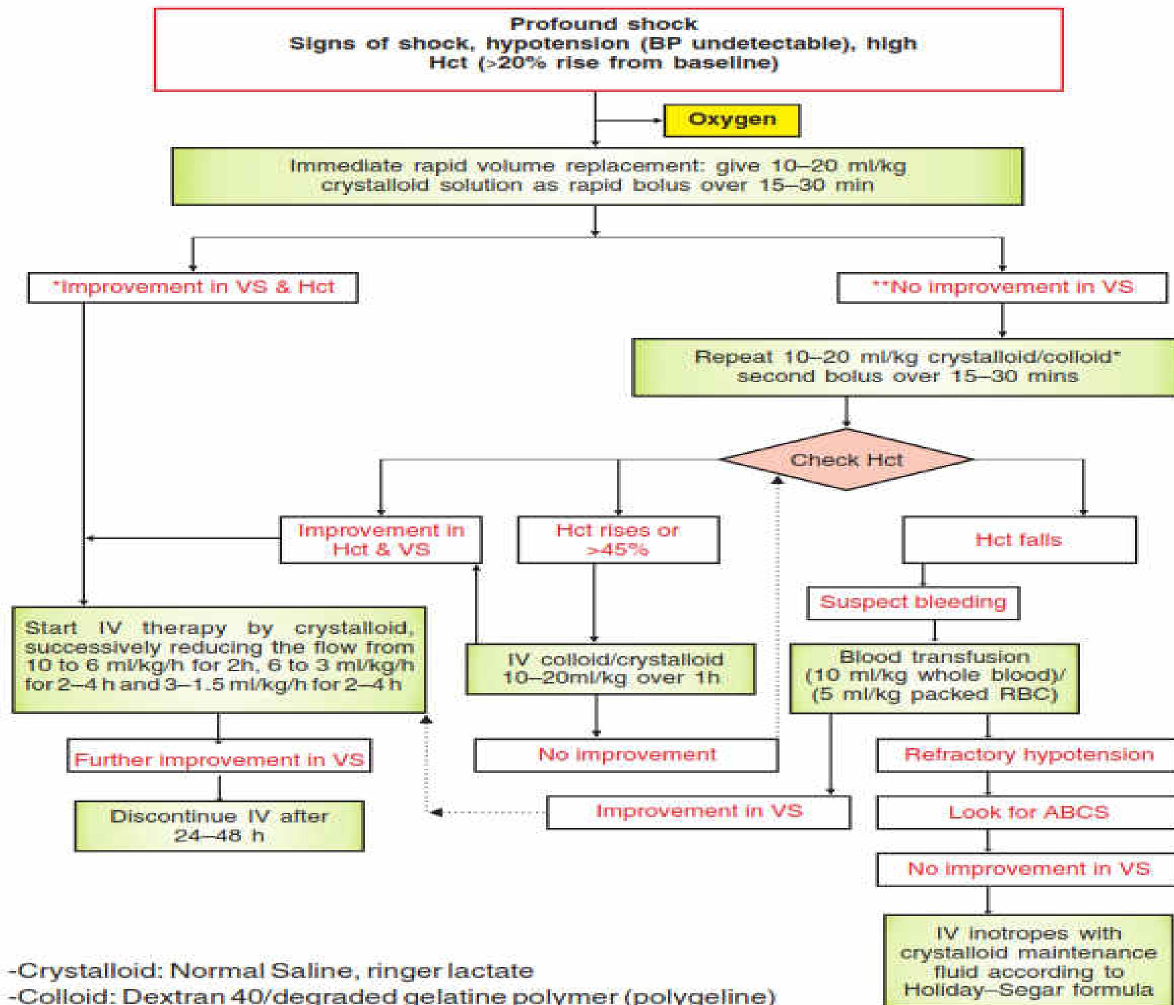


Crystalloid: Normal Saline, ringer lactate
Colloid: Dextran 40/degraded gelatine polymer (polygeline)
ABCS = Acidosis, Bleeding, Calcium (Na++ & K+), Sugar

Notes:
*Improvement: Hct falls, pulse rate and blood pressure stable, urine output rises
**No improvement: Hct or pulse rate rises, pulse pressure falls below 20 mmHg, urine output falls

- Unstable vital signs: urine output falls, signs of shock
- In cases of acidosis, hyperosmolar or Ringer's lactate solution should not be used
- Serial platelet and Hct determinations: drop in platelets and rise in Hct are essential for early diagnosis of DHF
- Cases of DHF should be observed every hour for vital signs and urine output

Chart 3. Volume replacement algorithm for patients with Severe Dengue Fever (DHF IV (DSS))



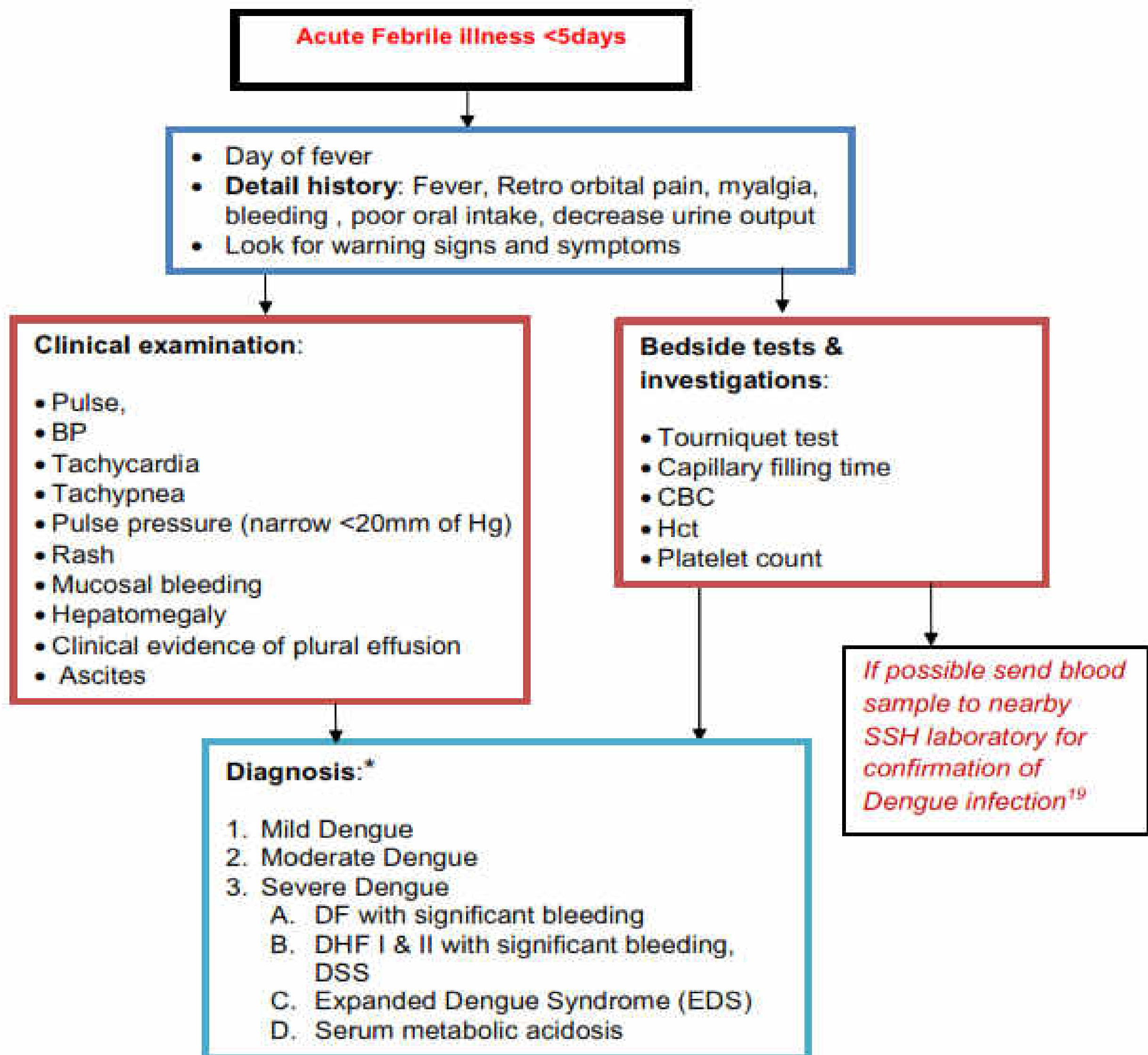
Notes:

*Improvement: Hct falls, pulse rate and blood pressure stable, urine output rises

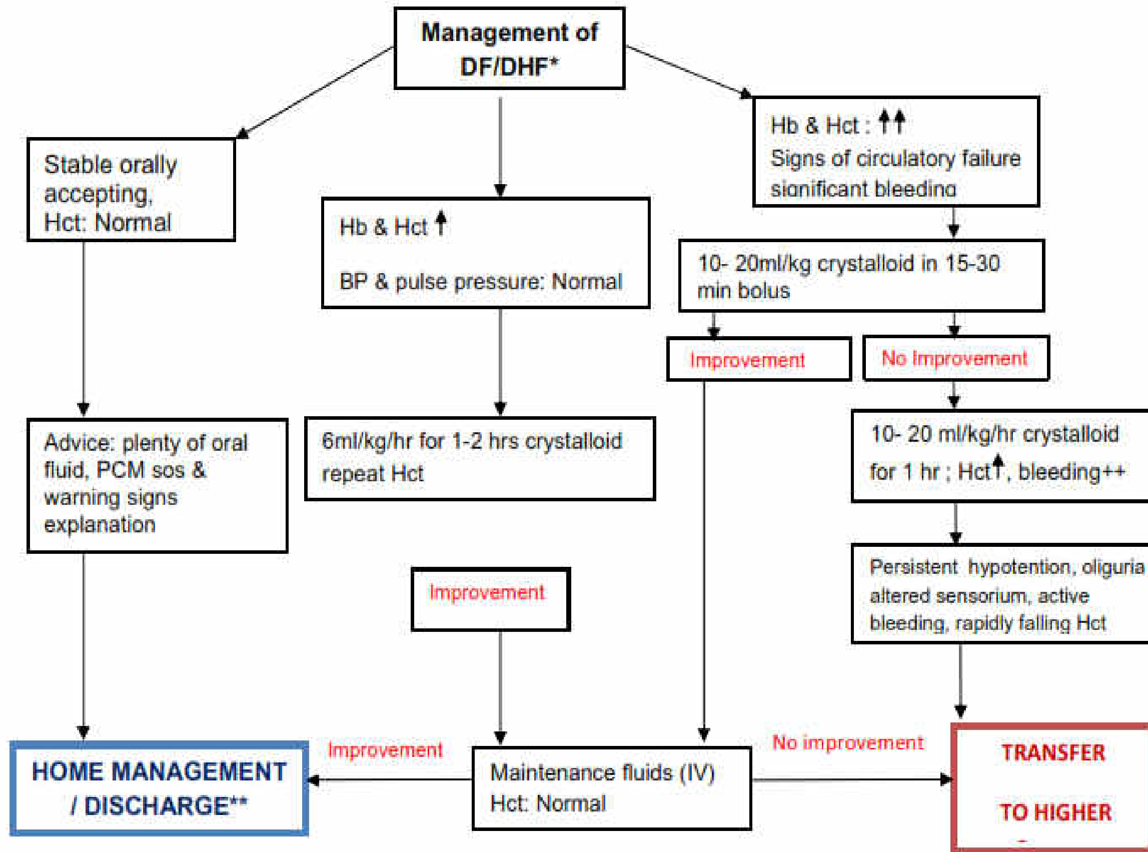
**No Improvement: Hct or pulse rate rises, pulse pressure falls below 20 mmHg, urine output falls

- Unstable vital signs: Urine output falls, signs of shock
- In cases of acidosis, hyperosmolar or Ringer's lactate solution should not be used
- Serial platelet and Hct determinations: drop in platelets and rise in Hct are essential for early diagnosis of DHF
- Cases of DHF should be observed every hour for vital signs and urine output

MANAGEMENT OF DENGUE CASES AT PRIMARY HEALTH CARE LEVEL AND REFERRAL



Management and referral of Dengue cases at PHC level



Management of severe bleeding

- Immediate attempt should be made to stop the bleeding.
- Always consider hidden Internal bleeding possibility
- Watch for profound shock.
  - Urgent blood transfusion
  - IV fluid or plasma expander
- In case of massive haemorrhage -rule out coagulopathy by testing for prothrombin time (PT) and a PTT

Indication of Platelet transfusion

- Platelet count less than 10000/cumm in absence of bleeding manifestations. (Prophylactic platelet transfusion).
- Prolonged shock with coagulopathy and abnormal coagulogram.
- Thrombocytopenia with haemorrhage.

➢ Packed cell transfusion/FFP along with platelets may be required in cases of severe bleeding with coagulopathy. Whole fresh blood transfusion doesn't have any role in managing thrombocytopenia.

Warning sign and symptoms

- High grade fever
- Abdominal pain
- Persistent Vomiting
- Bleeding from any part of body
- Decreased urine output
- Respiratory distress
- Convulsions/encephalopathy
- Fluid overload.
- Plasma leakage
- Shock/ impending shock

Indications for domiciliary management:

If patients have the following conditions:

- No tachycardia / no hypotension/ no narrowing of pulse pressure /no bleeding/ no hemoconcentration
- Platelet count > 100000/cumm

Patient should come for follow up after 24 hrs for evaluation should report to nearest hospital immediately in case of the following complaints:

- Bleeding from any site (fresh red spots on skin, black stools, red urine, nose bleed, menorrhagia)
- Severe Abdominal pain, refusal to take orally/ poor intake, persistent vomiting
- Not passing urine for 12 hrs/decreased urinary output
- Restlessness, seizures, excessive crying (young infant), altered sensorium, behavioural changes, severe persistent headache; Cold clammy skin; sudden drop in temperature

Criteria for admission of DF patient

- Significant bleeding from any site
- Any warning signs and symptoms
- Persistent high grade fever (40ºC and above)
- Impending circulatory failure
- tachycardia, postural hypotension, narrow pulse pressure(<20 mmHg, with rising diastolic pressure eg 100/90 mmHg), increased capillary refilling time > 3 secs (paediatric age group)
- Neurological abnormalities - restlessness, seizures, excessive crying (young infant), altered sensorium and behavioural changes, severe and persistent headache
- Drop in temperature &/or rapid deterioration in general condition
- Shock- cold clammy skin, hypotension/ narrow pulse pressure, tachypnoea. A patient may remain fully conscious until late stage

Criteria for discharge of patients

- Absence of fever for at least 24 hours without the use of anti-fever therapy
- No respiratory distress from pleural effusion or ascites
- Platelet count > 50 000/ cumm
- Return of appetite
- Good urine output
- Minimum of 2 to 3 days after recovery from shock
- Visible clinical improvement

NURSING CARE IN ADMITTED CASES

- Basic management
- Warning sign and symptoms
- Identifying and managing common problems in Dengue patients with-
  - High grade fever
  - Abdominal pain
  - Bleeding
  - Plasma leakage
  - Shock/ impending shock
  - Decreased urine output
  - Respiratory distress
  - Convulsions/encephalopathy
  - Fluid overload.

Patient Follow-Up

- **Patients treated at home**
  - Instruction regarding danger signs
  - Consider repeat clinical evaluation
- **Patients with bleeding manifestations**
  - Serial hematocrits and platelets at least daily until temperature normal for 1 to 2 days
- **All patients**
  - If blood sample taken within first 5 days after onset of fever, need convalescent sample between days 6 - 30

– All hospitalized patients need samples on admission and at discharge or death

Conclusion

- The guideline will provide systematic case management at all levels and helps to prevent complications and deaths.
- Proper Nursing Care is also important.
- Majority of the Dengue patients do not require platelet transfusion and there is no role of prophylactic platelet transfusion when platelet count is above 10000/cu mm.
- High risk groups need to be monitored closely.
- Looking for warning signs is crucial and timely referral if needed.
- Fluid management is very crucial.
- Unnecessary referral to tertiary centres to be avoided.

H1N1

ABC guidelines

<u>Category A</u>- **mild fever plus cough / sore throat** with or without body ache, headache, diarrhoea and vomiting

<u>Category-B</u> (Bi) Category-A **plus** high grade fever and severe sore throat

- (Bii) Category- Any ***mild ILI*** in a **<u>Pregnant woman or a</u>**
- patient with CO-MORBIDITIES---

1. Lung/ heart / liver/ kidney / neurological disease, blood disorders/ diabetes/ cancer /HIV-AIDS
2. On long term steroids
3. Children -- ***mild illness*** but **with predisposing risk factors**.
4. Age 65 years+.

<u>Category-C</u>

5. · Breathlessness, chest pain, drowsiness, fall in blood pressure, haemoptysis, cyanosis
6. · Children with ILI (influenza like illness) with ***red flag signs***
    1. (Somnolence, high/persistent fever, inability to feed well, convulsions, dyspnoea /respiratory distress, etc).
7. · Worsening of underlying chronic conditions.

Treatment

ABC

- A - supportive care, watch, modify
- B i- ? Start oseltamivir
- B ii- START Oseltamivir ***STAT***

- C- Admit, & ***<u>START Oseltamivir</u>***

Never, ever, wait for swab results

Antenatals Special

- Antenatals thrice weekly precautionary Surveillance to be started ,
- All institution MOs shall ensure that the JPHNS monitor health of all ANCs in their registers thrice a week, and start counselled Oseltamivir treatment for those with ILI /ARI (Cat B2 patient)
- *In clinical setting, special caution for any Cat B2 patient to be exercised*

Oseltamivir dosage schedule

- <u>Dose for treatment is as follows</u>:
  - By Weight:
- For weight <15kg 30 mg BD for 5 days
- 15-23kg 45 mg BD for 5 days
- 24-<40kg 60 mg BD for 5 days
- >40kg 75 mg BD for 5 days

Oseltamivir – Infants

- < 3 months 12 mg BD for 5 days
- 3-5 months 20 mg BD for 5 days
- 6-11 months 25 mg BD for 5 days
- Contents of the capsule can be divided and administered in powdered sugar, sugar syrup, or honey.

DIRECTORATE OF HEALTH SERVICES, KERALA

H1N1 INFLUENZA

Clinical features of an ILI (Influenza Like Illness) :
Upper respiratory symptoms, Cough, Sore throat, Fever,
Head ache, body ache, fatigue diarrhea and vomiting have also been observed

ABC GUIDELINES

1. Categorization

2. Management

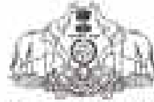
3. Oseltamivir dosage schedule

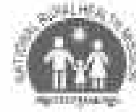
4. H1N1 in Pregnancy(AN and PN)

5. H1N1 Testing

6. Community spread- MOHFW guidelines...

7. Guidelines for schools / educational institutions





കേരള സർക്കാർ

ആരോഗ്യ കുടുംബക്ഷേമ വകുപ്പ്

1) പനി ഒരു രോഗമല്ല, രോഗ ലക്ഷണമാണ്. പനിയെ ഭയപ്പെടേണ്ട, രോഗിയെ ജാഗ്രതയോടെ പരിചരിക്കൂ.

2) പനികൾ പൊതുവെ 'വൈറൽ പനികളാണ്', അവയ്ക്ക് മിക്കപ്പോഴും പലതരം പരിശോധനകളും, നിരവധി ഔഷധങ്ങളും വേണ്ട.

3) സാധരണ വൈറൽ പനികൾ സുഖമാവാൻ മൂന്ന് മുതൽ അഞ്ചു ദിവസം വരെ വേണ്ടി വരാം.

4) പനിക്കെതിരെയുള്ള എല്ലാ മരുന്നുകളും - ഏറ്റവും ലളിതമായ പാരസെറ്റമോൾ പോലും - ഡോക്ടറുടെ നിർദ്ദേശ പ്രകാരം കഴിക്കുന്നതാണ് നല്ലത്.

5) ആശുപത്രിയിലായാലും വീട്ടിലായാലും ശരീരത്തിന് വേണ്ടത്ര ശ്രദ്ധയും പരിചരണവും നൽകേണ്ടതാണ്. രോഗം വേഗം മാറാനും പനിവിട്ടുപോയശേഷമുള്ള ക്ഷീണം കുറയ്ക്കാനും താഴെപ്പറയുന്ന കാര്യങ്ങൾ ചെയ്യുക.

   എ) ചൂടുള്ള പാനീയങ്ങൾ ക്രമമായി നിരന്തരം കുടിയ്ക്കുക. ഉപ്പുചേർത്ത കട്ടിയുള്ള കഞ്ഞിവെള്ളം, നാരങ്ങാവെള്ളം, ഇളനീർ എന്നിവ കട്ടൻചായ, കട്ടൻകാപ്പി, ജീരക വെള്ളം, വെറും ചൂടുവെള്ളം എന്നിവയേക്കാൾ നല്ലതാണ്.

   ബി) നന്നായി വേവിച്ച മൃദുവായ, പോഷക പ്രധാനമായ ഭക്ഷണവും, ചുറ്റുവട്ടത്ത് ലഭ്യമായ പഴങ്ങളും ചെറിയ അളവിൽ ഇടവിട്ട് തുടർച്ചയായി കഴിക്കുക.

(മറുപുറം)

സി) പനി പൂർണ്ണമായി മാറും വരെ വിശ്രമിക്കുക. രോഗം വേഗം വിട്ടൊഴിയാൻ അതു സഹായിക്കും. ഇത് പനി പകരുന്നത് തടയുകയും ചെയ്യുന്നു.

6) കുത്തിവയ്പ്പിനു വേണ്ടിയും, ഡ്രിപ്പിനു വേണ്ടിയും ഡോക്ടർമാരെ നിർബന്ധിക്കാതിരിക്കുക. മിക്കപ്പോഴും അവ ആവശ്യമില്ല. ചിലപ്പോൾ അവ വിറയൽ, വേദന, മനംപുരട്ടൽ തുടങ്ങിയ പാർശ്വഫലങ്ങൾ ഉണ്ടാക്കാം. ഇവ ഒരു പക്ഷേ ഗുരുതരമായി തീരുകയും ചെയ്യാം.

7) **കഴിക്കുന്ന പാരസെറ്റമോൾ ഗുളികകളെക്കാൾ കൂടുതൽ മെച്ചപ്പെട്ടരീതിയിലും വേഗത്തിലും കുത്തിവയ്പ്പുകൾ പ്രവർത്തിക്കുന്നില്ല എന്നറിയുക.**

8) വീട്ടിൽ ചികിത്സിക്കുന്നവർ താഴെപ്പറയുന്ന ഘട്ടങ്ങളിൽ ആശുപത്രിയിൽ എത്തിച്ചേരുക.

എ) പ്രതീക്ഷിച്ച സമയം കൊണ്ട് പനി ഭേദമാകുന്നില്ല.

ബി) നല്ല ചികിത്സയും പരിചരണവും ലഭിച്ച ശേഷവും പനി മൂർച്ഛിക്കുന്നു.

സി) ശരീരത്തിൽ പാടുകൾ, തിണർപ്പുകൾ, ജന്നി, രക്തസ്രാവം, മഞ്ഞപ്പിത്തം, മൂത്രത്തിന്റെ അളവ് കുറയുക, ശ്വാസം എടുക്കാൻ ബുദ്ധിമുട്ട്, പെരുമാറ്റ വ്യതിയാനം എന്നിങ്ങനെ സാധാരണമല്ലാത്ത ലക്ഷണങ്ങൾ ഉണ്ടാവുന്നു.

ഡി) ഭക്ഷണം കഴിക്കാൻ വയ്യാതാകുന്നു.

9) തുമ്മുമ്പോഴും, ചീറ്റുമ്പോഴും, മൂക്കും വായും പൊത്തുക. സോപ്പും വെള്ളവും ഉപയോഗിച്ച് കൈകൾ ഇടയ്ക്കിടെ കഴുകുക. വൈറൽ പനികൾ പടർന്നു പിടിക്കുന്നത് തടയാനും ശ്വാസകോശ രോഗങ്ങൾ വീട്ടിലെ മറ്റുള്ളവരിലേക്ക് പകരാതെ സൂക്ഷിക്കാനും ഈ ശീലം സഹായിക്കും.

10) **സ്വയം ചികിത്സ അപകടകരമായ ഒരു ശീലമാണ്. ഡോക്ടറുടെ നിർദ്ദേശമില്ലാതെ മരുന്ന് വാങ്ങി കഴിക്കുന്നത് ഒഴിവാക്കുക.**

Community role in a PHEIC

- “ Why did I get it ??? ”
- **……………The Triangle of Causation**
- Increase your immunity
  - Food, fluids, rest, Ayush remedies
- Prevent transmission
  - Cough etiquette, hand wash, take leave
- Facilitate early detection
  - Report to a doctor if
    - Unexpected increase of symptoms
    - Not getting better in expected time
    - You are slightly ill, and belong to high risk group

Testing & Lab facilities

- *Testing **only for epidemiological purposes**, eg.- unusual in presentation, area of residence, failure to respond even after 5 days treatment eltamivir therapy, institutional spread, e*

MCVR Manipal – Dr Arun Kumar, HOD Virology

- Manipal Centre for Virology Research, Manipal 0984584163

NIV Alappuzha- Dr Anukumar Balakrishnan

- NIV Kerala Unit, 2nd Floor, E Block Govt TD Medical College, Alappuzha
- Tel 0477 2970004, 2280100
- nivkeralaunit@gmail.com

Lab allotment proposed for 2016

MVCR Manipal (Thrissur, Palakkad, Malappuram, Wayanad, Kozhikkode, Kannur, Kasargode)

NIV Kerala Unit Alappuzha Trivandrum, Kollam, Pathanamthitta, Kottayam, Idukki, Alappuzha, Ernakulam

Contacts and Clarifications

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KYASANUR FOREST DISEASE (KFD)

Epidemiology

- **Agent**
- B group Arbovirus (RNA virus belong to the genus Flavivirus that is antigenically related to Langat, DHF& WestNile Virus)

- **VECTOR**
- Transmitted by Haemophysalis ticks (common species spinigera)
- **INCUBATION PERIOD**
- 3-8 days after exposure to infective tick bite.

SYMPTOMATOLOGY

- Fever, chills, headache, joint pains, myalgia and vomiting are the initial symptoms.
- Diarrhoea may be present in some cases.
- Sore throat and bleeding manifestations may be seen after 2-3 days.
- Severe prostration is a constant accompaniment.
- Altered sensorium, headache out of proportion to fever, with or without seizures.
- Bleeding manifestations indicate grave prognosis

CLINICAL FINDINGS

- **Conjunctiva suffusion**
- **Low blood pressure**, readily improving with IV fluids.

- **Oral ulcers and papulo-vesicular lesions** over the palate may be seen.
- Bleeding manifestations like **petechial skin haemorrhages and epistaxis** may be seen.

COMPLICATIONS

FROM THE SECOND WEEK ONWARDS

- Neurological manifestations-severe headache, neck stiffness, altered sensorium, seizures, and focal neurologic deficits including vision deficits may be seen.
- Death can also happen if not attended properly.
- Haemorrhagic complications may occur.
- Hepatic dysfunction, renal failure, Myocarditis, Pneumonitis & pancreatitis can also occur.

WARNING SIGNS FOR REFERRAL

Neurological Signs

- Drop in GCS score, headache disproportionate to fever, focal neurological deficits, neck stiffness, seizures

Circulatory

- Hypotension

Deterioration of respiratory function

- Rising respiratory rate, chest signs, falling SPO2

INVESTIGATIONS

BLOOD ROUTINE EXAMINATION

- Leukopenia less than 4000/cu mm with relative lymphocytosis, mild thrombocytopenia

BIO CHEMISTRY TESTS

- Liver Function Test shows varying degrees of abnormalities

- Renal function Test- Abnormalities may be seen.
- Repeated if necessary
- PT/INR, APTT if indicated.
- HB Electrophoresis for those of Tribal/Ethnic Communities.

SPECIAL DIAGNOSTIC TEST FOR

CONFIRMATION (for epidemiological purposes) by

- Molecular detection by **RT-PCR** or virus isolation from blood
- in the early stage of illness (within 5 days of onset)
- After 5 days**, IgM ELISA** for antibody detection.

TESTS FOR DETECTING COMPLICATIONS

- ECG to rule out myocarditis (Tachycardia, diffuse ST, T wave
- changes are suggestive of myocarditis
- X ray chest to rule out Pneumonitis
- EEG& MRI- to diagnose encephalitis

POPULATION AT RISK

- Individuals with fever and associated symptoms hailing from villages previously affected with KFD.
- Individuals with fever and associated symptoms hailing from an area of within 5 Km of monkey death
- Human cases/death due to suspected/confirmed KFD and Tick positives for KFD virus.
- Individuals frequently visiting forests- Forests & Wildlife Department personnel, those involved in fire line work, firewood gathering, cattle grazing etc and presenting with fever and associated symptoms

ALL SUSPECTED AND EPIDEMIOLOGICALLY LINKED CASES MUST BE ADMITTED TO MAJOR HOSPITALS

TREATMENT

- Adequate rest and hydration.
- If necessary, IV Fluids
- Paracetamol- if not contraindicated otherwise
- No NSAIDs.
- Antibiotics may be started, considering differential diagnosis, secondary infection etc
- Broad spectrum antibiotics to be given in patients presenting with neutropenia

MONITORING

- Temperature, Pulse, Blood Pressure, SpO2 to be monitored **4 Hourly &SOS**
- **GLASGOW COMA SCALE SCORE- 12 hourly or** more frequently as and when required.
- Fluid intake /output chart.

REFERRAL

Before referring the patient start the following

- I**f nervous system related complications (Encephalitis)**

-Inj. Dexamethasone 8mg I.V. stat, 4 mg IV 8 hrly

-Inj. Mannitol 100 ml I.V. 8 hrly

-Anticonvulsant

-Inj. Levetricetam- 40-60 mg / Kg body weight IV.

(Inj. Phenytoin is to be avoided)

- **If Hypotension**

-Fluid replenishment, inotropes may be attempted with necessary precautions

- **In case of referral, inform the higher centres in advance about the case**.
- **Basic life support systems should be given during transit to higher centres.**

FOLLOW UP

The discharged patients must be followed up for 3-4 weeks for development of second phase of illness/ complications.

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Leptospirosis

Symptomatology

- **Initially**
  - Fever, **MYALGIA** and head ache.
- **Later**
- jaundice, oliguria, bleeding tendency, respiratory distress, cardiac failure, convulsions and coma.
- <u>**Clinical findings**</u>
- Fever, **muscle tenderness** especially calf and thigh, low backache, congestion of eyes, later may have sub conjunctival haemorrhage, Jaundice and evidence of hepatic, pulmonary and renal involvement.

Complications

- *Can occur even in the 1st week.*
- Bleeding tendency, Thrombocytopenia and Liver failure, Renal failure.
- Acute respiratory distress
- Hypotension, Myocarditis, Pancreatitis, Convulsions and Coma.

Investigations

- <u>**Early (1st 3 days)**</u>-
- <u>Blood</u>- TC, DC- Neutrophilic leukocytosis.
- <u>**After 3 days**</u> –
- Mild / moderate thrombocytopenia,
- Increased S. Bilirubin with <u>disproportionately low** elevation</u> (Usually <500 IU/L) of ALT (SGPT) & AST (SGOT).

- Increased Blood Urea & Serum creatinine,
- Increased CPK, Increased Serum Amylase.
- **After 5 days-** Ig M Eliza which is the confirmatory test- Four fold rise in paired serum samples.

INVESTIGATIONS-2

- **Chest Xray**
- Non homogenous patchy opacities if ARDS develops.
- **ECG**

Tachycardia disproportionate to fever, with non specific ST-T changes

TREATMENT

- **First 3 days**

May be treated as OP if vital signs are stable and **if the patient is available for follow up.**

- **Specific treatment**
  - Cap **Doxycycline 100 mg bd** x 7 days (preferred)
  - Or
  - Cap **Amoxycillin 500 mg q8h** x 1 week.
- ***For children***
  - ***If over 8 years,***-- *Cap* ***Doxy 5 mg /Kg/day****, divided 12 hourly, x 7 days*
  - ***If below 8 years***
  - *--Tab.* ***Amoxycillin 50 mg/Kg/day****, divided 8th hourly x 7 days*
  - *Or*
  - ***Azithromycin 10 mg/Kg/day****, OD x 3 day*

- ***<u>Toxic patients with Red flag signs, late consultations and organ dysfunction</u>***
- Need IP admission & parenteral antibiotics as follows-
- Inj **CP 15 L 6Hrly** x 7 days or **Ceftriaxone 1-2 gm bd** x 7 days.
- (Ciprofloxacin & Macrolides are alternatives)
- ***<u>For children</u>***
- *Inj **CP 2-3 L/Kg /day**,* divided 6 hourly x 7 days.
- *or*
- *Inj. **Ceftriaxone 50 mg/Kg/day**, divided 12 hourly* x 7 days.

Special precautions

- Monitor Fluid intake-output chart for adequate hydration.
- Monitor for Red Flag signs
- Avoid NSAID

Red Flag signs

- No response to antibiotics in 8 hrs.
- -Resp: rate >30/min.
- -Urine output< 20 ml/Hr.
- -BP<90mm systolic.
- -Tachycardia out of proportion to fever.
- -Flapping tremor.
- -Altered sensorium

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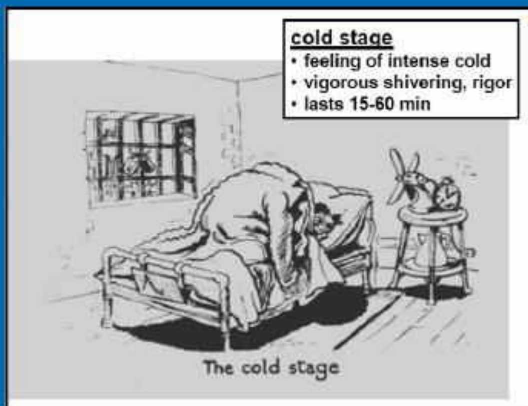
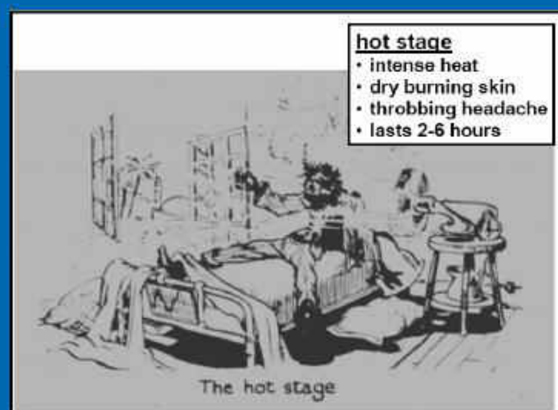
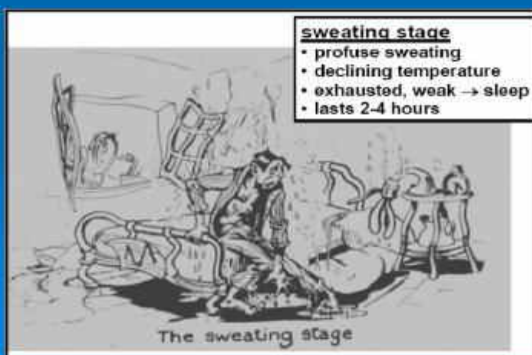
Malaria

Symptoms

- Fever
- Chills
- Sweats
- Headaches
- Nausea and vomiting
- Body aches
- General malaise







Classical malaria is rarely observed

Last 6-10 hours

Cold Stage

Hot stage

Sweating Stage

Diagnosis

Microscopy

- gold standard
- The sensitivity is high.
- quantify the parasite load.
- distinguish the various species

Bivalent RDT

- Detection of circulating parasite antigens.
- Detection of both Plasmodium vivax and P. falciparum at locations where microscopy results are not obtainable within 24 hours of sample collection.

Malaria- Treatment

(National drug Policy -2013)

- No Presumptive Treatment is recommended

• All fever cases suspected to be malaria should be investigated by microscopy or RDT.

• Provide full course treatment as SDA (Supervised Drug Administration) for all patients.

• Use appropriate regimen for the type of parasite

• **Vivax Malaria**

– CQ for 3 days {600mg (4 tablets) on 1st day, 600 mg (4 tablets) on 2nd day and 300mg (2 tablets) on 3rd day} + Primaquine 15mg daily for 14 days

- **Falciparum Malaria**
- – ACT for 3 days + Primaquine 45mg on second day
- • **Mixed Malaria**
- – ACT for 3 days + PQ- 15mg/day for 14 days from 2nd day onwards.

- Note: (1) Primaquine should not be used in Pregnancy, Infancy and G6PD deficiency
- (2) ACT is Artemesinin Combination Therapy (Artesunate for 3 days + Sulphadoxine-Pyrimethamine for 1 day)
- (3) Primaquine and Sulphadoxine-Pyrimethamine should not be given on the same day.
- Hence avoid PQ on the first day of ACT regimen
- (4) ACT not given during the 1st TM of pregnancy but given during 2nd and 3rd TMs.
- Use Quinine during the 1st TM.

Drug schedule for treatment of malaria under NVBDCP

- Treatment of **P.vivax cases**
- 1**. Chloroquine**: 25 mg/kg body weight divided over three days i.e. 10mg/kg on day 1, 10mg/kg on day 2 and 5mg/kg on day 3.
- 2. **Primaquine:** 0.25 mg/kg body weight daily for 14 days.

Age-wise dosage schedule for treatment of *P.vivax* cases

Age (years)	Tablet Chloroquine (150 mg base)			Tablet Primaquine* (2.5 mg base)
	Day 1	Day 2	Day 3	Day 1 to 14
<1	1/2	1/2	1/4	0
1 – 4	1	1	1/2	1
5 – 8	2	2	1	2
9 – 14	3	3	1 1/2	4
15 and above	4	4	2	6

* Primaquine is contraindicated in infants, pregnant women and individuals with G6PD deficiency. 14 day regimen of Primaquine should be given under supervision.

Treatment of uncomplicated P.falciparum cases

- **1. Artemisinin based Combination Therapy (ACT)***

- Artesunate 4 mg/kg body weight daily for 3 days Plus

- Sulfadoxine (25 mg/kg body weight) . Pyrimethamine (1.25 mg/kg body weight) on first day plus

- Single dose of Primaquine 0.75 mg/Kg bw on 2nd day

* ACT not given in 1st TM of pregnancy.

Age-wise dosage schedule for treatment of *P.falciparum* cases

Age (years)	Day 1		Day 2		Day 3
	Artesunate 50mg	SP*	Artesunate 50mg	Primaquine 7.5 mg	Artesunate 50mg
<1	½	¼	½	0	½
1 - 4	1	1	1	1	1
5 - 8	2	1½	2	2	2
9 - 14	3	2	3	4	3
15 and above	4	3	4	6	4

* Each Sulphadoxine-Pyrimethamine (SP) tablet contains 500 mg sulphadoxine and 25 mg pyrimethamine

Treatment of uncomplicated P.falciparum cases in pregnancy

- **1st TM** : Quinine salt 10mg/kg tds x 7 days.
- **Note**: Quinine may induce hypoglycemia; pregnant women should not take quinine on empty stomach and should eat regularly, while on quinine treatment.
- **2nd & 3rd TM**: ACT as per dosage given above.
- **Treatment of mixed infections (*PV &PF)***

Full course of ACT &PQ 0.25 mg/kg x 14 days

Treatment of severe malaria cases

- Emergency and treatment based on severity, associated complications & decision of treating physician.
- **Artesunate:** 2.4 mg/kg IV or IM given on admission (time = 0 h); then at 12 h and 24 h & then once a day. (or)
- **Artemether:** 3.2 mg/kg IM given on admission and then 1.6 mg/kg /day. (or)
- **Arteether:** 150 mg IM daily for 3 days in adults (not for children). (or)

Quinine: 20 mg/kg* on admission (IV infusion or divided IM injection) followed by maintenance dose of 10 mg/kg 8 hourly.

- The infusion rate should not exceed 5 mg salt/kg b.w/hour.
- *loading dose of 20mg /kg Quinine on admission not given if the patient has already received quinine or if the clinician feels inappropriate.)
- **Note:**
- The parenteral treatment in severe malaria cases should be given for minimum of 24 hours.
- Once started irrespective of the patient's ability to tolerate oral medication earlier, not given for more than 24 hours.
- After parenteral artemisinin therapy, patients should receive a full course of oral ACT for 3 days.

- Patients who received parenteral Quinine therapy should receive:
- Oral Quinine 10 mg/kg b.w 3 tds*7 days (including the days when parenteral Quinine was administered) plus Doxycycline 3 mg/kg b.w once a day or Clindamycin 10 mg/kg bw 12-hourly for 7 days
- (Doxycycline is contraindicated in pregnancy & children<8 years of age). (or)
- ACT as described

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Scrub Typhus

Symptomatology

- High grade fever, chills & rigor.
- Severe myalgia and body ache.
- Intense headache .
- Throat pain and dry cough .
- Chest pain and breathlessness.
- Generally upper respiratory symptoms are not a feature of scrub typhus.
- **Clinical findings:**
  - ***Conjunctival congestion.***
  - ***Maculopapular rash.***
  - ***Regional lymphadenopathy .***
  - ***Spleen enlargement.***
  - ***Eschar***

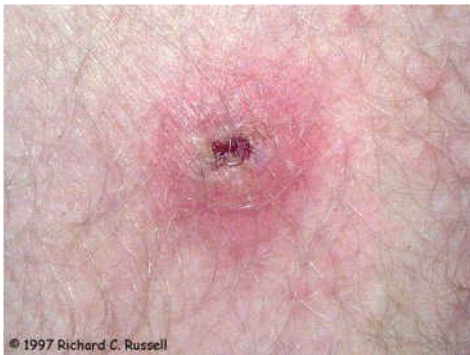
High index of suspicion scrub typhus when---

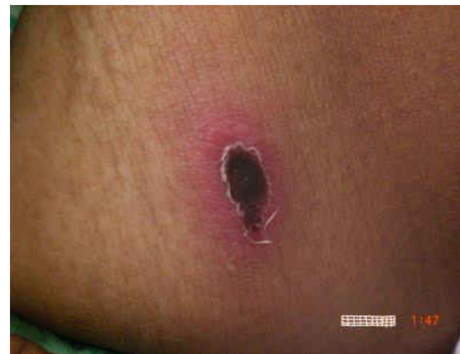
- Fever WITHOUT upper resp symptoms , usually
- Febrile illness lasting more than 1 week
- Failure of a Febrile illness to respond to conventional antibiotics

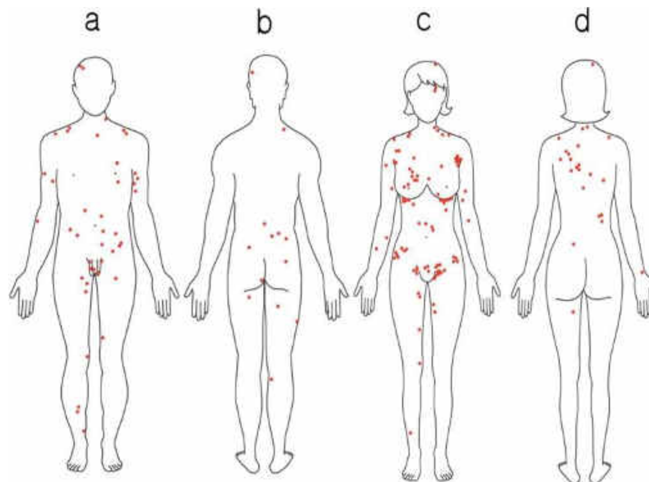
Eschar

- Starts as an enlarging papule at the site of chigger bite
- Often in the concealed , moist areas of the body like axilla/inguinal region /under the breasts

- Later develops in to the **classical eschar**
  - ***Not usually larger than 1cm in diameter.***
  - ***Central necrotic black scab,***
  - ***surrounded by a raised ring***
  - ***surrounding erythema.***
  - ***usually not itchy or painful.***
  - ***Eschar is seen in as many as 50% of patients***.







Complications

- Pneumonitis,
- Myocarditis
- Encephalitis

INVESTIGATIONS

Blood Routine examination

  - Leucopenia.
  - **Relative lymphocytosis.**
  - Thrombocytopenia.

Liver function tests:

- Serum bilirubin -- mild elevation.
- SGOT and SGPT -- moderately elevated.
- Alkaline phosphatase may be increased.

Renal function tests:

- Usually normal unless the patient develops a pre-renal or renal failure.
- Serial RFT values are to be done for early diagnosis.

Specific diagnostic tests

Scrub antibody test:

- IgM Elisa is the specific test.
- A single high titer of Ig M antibodies with classical clinical features is considered as a probable case.
- Fourfold increase in Ig M antibodies is confirmatory
- **Weil Felix Reaction:**

- Positive result is only obtained late in the course of illness. It is not a very sensitive test. False positives and false negatives are common and hence not reliable.

Tests for detecting complications

- **ECG :** To rule out **myocarditis**
  - (Tachycardia and diffuse ST,T wave changes)
- **Chest X-Ray :** To rule out **pneumonitis.**
  - (Non-homogenous patchy opacities without air bronchogram.)
- **EEG and MRI:** To diagnose **encephalitis**

TREATMENT

- **General measures:**
- ***Antipyretics:***
- Paracetamol – 500-650mg 6hrly and SOS
- *Avoid NSAIDs to prevent renal injury*
- Tepid sponging to lower the temperature
- Adequate fluid intake

TREATMENT—Antibiotics

- **Early initiation of treatment is very important.**
  - **person from known endemic area, + high grade fever and chills**
  - **start treatment early even in the absence of localizing infection and eschar.**
- **-Cap Doxycycline:**
- 100mg BD x 5-7 days

OR

- **-Tab Azithromycin**:
- 500mg OD x 5-7 days.
- [Azithromycin 10 mg/kg/day, OD for children]
- Azithromycin is generally the preferred drug for children <8 years and pregnant women.
- [Absence of response to doxycycline is an indication for investigating for other causes]

PREVENTION

- Protective clothing and use of insect repellents.

Chemoprophylaxis

- Only in special circumstances.
- **Cap Doxycycline**
- 100mg once weekly after food for 6 weeks after exposure.

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Short Febrile Illness (SFI)

<u>General approach to Short Febrile Illness</u>(based on time of arrival of patient and onset of fever)

- First day of fever-------------- history + supportive care
- Fever more than 3 days------may need investigation based approach
- Partly treated fever----------- investigation based approach

First day (1-3day) fever for any patient

- **suspect-the following**
- **Myocarditis:-** PR/HR -tachycardia out of proportion to fever (expect 10 beats increase per deg F rise, or 18 bts/deg C, of temperature rise
- **Broncho pneumonia:-** RR- tachypnoea out of proportion to fever (Normal RR 16-24/min. Any RR above 30 /min- view with caution)
- ***In children*** view with caution any RR > **60** upto 2 months, > **50** -2mo to 1 yr , > **40** -1yr to 5 yr, and > **30** in older children
- **Meningitis , Encephalitis:-** Altered sensorium
- **Impending shock:-** BP – always check in any unduly sick patient

Approaches to Fever –

- **With focus** ---------investigate and manage appropriately
- **Without focus ----**
  - With upper respiratory -- ILI, ARI, SARI—manage as per ABC guidelines,
  - ***Without upper respiratory symptoms***---- Consider Dengue fever , Malaria, Leptospirosis, Chikungunya, etc
  - With rash--- think of Measles, Dengue, IMN, Rubella..

Specific diagnostic pointers/hints with Public Health perspective

- **Muscle tenderness +**First consultation with fever and conjunctival congestion / jaundice / severe myalgia / +/- 'high risk job'—**? Leptospirosis**
- **Severe myalgia +**Fever and **/conjunctival congestion**/rash ? **Dengue**
- **Chills and rigor**, periodicity, spleenomegaly /migrant patient —? **malaria**,
- Rash, toxic febrile look, no response to usual antibiotics **---eschar...? Scrub typhus**-

Actions if you suspect 'something unusual' in a patient in a crowded OPD, but want more time for a detailed examination:

- The patient should be **segregated**, and re-examined. In the meanwhile --
- Give **symptomatic treatment** for fever- single dose oral paracetamol *(avoid injections)* ,
- Orally **hydrate**
- **Check** BP(in adults) (in children look for perfusion – sensorium, color and temperature of extremities, Capillary Refill Time(normal < 3 sec)—
- If you strongly **suspect** myocarditis/ ARDS/ Encephalitis ? –Refer the patient to higher centre

Investigations

- First three days--usually investigations are not required unless it is definitely indicated
- Uncomplicated/ not sick – Short Febrile Illness / ILI –no need for investigation
- Looks 'sick', / has '**unusual'** symptoms at any time--- do appropriate investigation.
- ***Always communicate to the patient/relatives why you decide to investigate/not investigate, at that point of time.***

Control of the fever

- Tepid Sponging
- Paracetamol- 500-1000 mg q8h, max 4000 mg /day adult. ,and 10-15 mg/ kg/dose, q4- 6 h orally for children .
- Common formulations are
  - tablets of 500, 650
  - syrups of 120, 125, 178, and 250mg per 5 ml,
  - drops of 100mg/ml.
  - Suppositories of 80/170/250 mg
  - **In addition various 'cold remedies' contain additional 150mg/ml, 125 mg/5ml or 500 mg /tab, of paracetamol
- ***<u>Injection Paracetamol has no clinical superiority to oral route</u>*****<u>, and is to be strongly discouraged</u>**, for the following additional reasons.
- *Chance of allergic reactions.*
- *Unsafe injection practices and needle stick injury, risk to staff due to overloads in injection rooms.*

Caution when:

- Not improving in the expected time frame
- Getting worse in spite of appropriate treatment
- New symptoms appear-eg., rash, seizures, altered sensorium, jaundice, reduced urine output, etc.

Supportive care – ***<u>Non Phamacological General Management of Fevers</u>***

A. Fluids --Oral fluids are the safest

- ‘Home available fluid’ like kanji water, with some added salt and lime juice is the best in all situations except severe dehydration, and cholera. Small frequent quantities may be given repeatedly .
- This fluid type and rate of intake often reduces the need for anti- emetics
- **IV fluids only for persistent vomiting, severe dehydration, paralytic ileus, shock, cholera, and patient clinically too sick to consciously drink.**

B. Sponging

- Use tepid water
- Increase the body surface area being sponged as necessary.
- Cooling the forehead alone with a piece of cloth is not enough

C. Food

- No restriction, on the other hand, steady intake of warm, soft well cooked nutritious home available food, is to be specifically advised
- The only advice is-‘Smaller quantity at a time, distributed more frequently’

D.Rest

Advise rest till the patient is symptom free. Children should not be sent to school

Proper communication to the patients, bystanders, public

- Fever is a symptom, and not a disease- fear not the fever, but be careful about the cause
- The commonest fevers are ‘viral fevers’ which do not require multiple medications or various tests.,
- Most viral fevers take 3-5 days to recover.
- Even paracetamol, the simplest remedy for fevers should preferably be taken according tothe doctors advice.

Some danger signs in a patient with fever

- Rash
- Fits
- Bleeding from any site
- Jaundice
- Reduced quantity of urine
- Breathing difficulty
- Altered behaviour etc.

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