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All Provincial Directors of Health Services
 Regional Directors of Health Services
 Heads of Institutions

Guidelines on Management of Dengue Fever and Dengue Haemorrhagic Fever

The impact Dengue illness has on the health care delivery system of Sri Lanka in recent years has been very significant. A large number of Dengue patients are regularly seen at both Out-Patient Departments as well as in the Wards in most hospitals in the country. This highlights the need for frequent updates on the knowledge and practices of clinical management of Dengue illness. Therefore, the Ministry of Health has prepared this Circular to be used in all health care institutions in the country.

This Circular is in 5 parts as given below:

- Part - A** : First Contact Management in adults and children for Primary Care Doctors [e.g. OPD Medical Officers, General Practitioners, etc.]
- Part - B** : In-ward patients care
- Part - C** : Monitoring during hospital stay for adult and paediatric patients
- Part - D** : Transferring a patient to another institution
- Part - E** : Institutional Dengue Death Review

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Part - A

First Contact Management in adults and children for Primary Care Doctors

Early detection of Dengue illness (Dengue Fever-DF/Dengue Haemorrhagic Fever-DHF) :

Early identification and management of Dengue illness can minimize morbidity and mortality. In the present hyper-endemic setting in Sri Lanka, Dengue illness (DF /DHF) should be considered in the differential diagnosis of patients **presenting with acute onset of fever with headache, retro-orbital pain, myalgia, arthralgia, rash (diffuse, erythematous, macular), haemorrhagic manifestation (petechiae, positive tourniquet test), leukopenia ($<5000/mm^3$), platelet count $\leq 150,000/mm^3$ and rising haematocrit of 5-10%**.

The patients may present with atypical manifestations like respiratory symptoms such as cough, rhinitis or injected pharynx and gastro-intestinal symptoms such as constipation, colicky abdominal pain, diarrhoea or vomiting with or without the classical clinical presentation described above.

In any patient who presents with shock (particularly afebrile at presentation with cold extremities and tachycardia with low volume pulse and hypotension) consider **Dengue Shock** as a likely diagnosis.

If a patient with high fever is seen with flushed face/extremities (diffuse blanching erythema in adults) and a positive tourniquet test (even with normal platelet count) with leukopenia (WBC $<5000/mm^3$) without any focus of infection, it is very likely that the patient is having Dengue illness.

Ambulatory care:

First contact doctors should ensure adequate oral fluid intake.

- In adults around 2500 ml for 24 hours (if the body weight is less than 50kg give fluids as 50ml/kg for 24hours or 2ml/kg/hr) is recommended during Febrile Phase (before admission to hospital).
- In children calculation of maintenance fluid is as follows:

$$\begin{aligned} M \text{ (Maintenance)} &= 100\text{ml/kg for first 10 kg} \\ &+50 \text{ ml/kg for next 10 kg} \\ &+20 \text{ ml/kg for balance weight.} \end{aligned}$$

The fluids should consist of oral rehydration fluid, king coconut water, other fruit juices, kanji or soup rather than plain water. Exclude red and brown drinks which could cause confusion with haematemesis or coffee ground vomitus.

If the patient is vomiting, having diarrhoea or dehydrated, total fluid requirement will depend on the degree of dehydration.

Following measures are also recommended:

- Adequate physical rest (off school and work with fever)
- Tepid sponging for fever
- Paracetamol not exceeding 2 tablets six hourly (reduce dose for children as 10-15mg/kg/dose. Do not exceed 60mg/kg/24hrs). Warn the patient that the fever may not fully settle with paracetamol and advise not to take excess.

Annexure VII

Information to be presented at the Institutional Dengue Death Review

1. Brief History and Clinical course while in hospital with special reference to condition on admission(walking-in patient haemodynamically stable/in shock) and associated co-morbidities and complications
2. Laboratory investigations specially the beginning and the end of critical phase computed with the sequential changes in FBC
3. Management of the patient specially giving attention to,
 - The Fluid management issues including calculation of fluid quota and the spread of crystalloids and colloids during the entire critical period in relation to monitoring.
 - Patient presenting in shock details of resuscitation and post resuscitation management
4. Summary of monitoring:
 - a) Clinical,
 - b) Vital signs - basic parameters (pulse, BP, PP) and indicators of peripheral perfusion (skin colour, skin temperature, CRFT),
 - c) Serial HCT and,
 - d) UOP on the weight use for fluid calculation (ml/kg/hr)
5. Adjuvant therapy - A, B, C, S assessment (A - Acidosis, B - Bleeding, C - Calcium and other electrolytes, S - Sugar)
6. Assessment of organ involvement (e.g. Liver, Renal functions)
7. Serology / other confirmatory tests
8. Post mortem findings if autopsy done
9. Probable cause of Death:
 - a) Underlying primary cause (e.g. Fluid Overload /Prolonged Shock or both)
 - b) Consequences of primary cause (e.g. pulmonary oedema due to fluid overload, multi organ failure due to prolonged shock)
 - c) Unusual dengue with single organ involvement
10. Place of managing the patient in sequential order (ETU > HDU > ICU)
11. Any additional information could be added depending on the necessity

Annexure VI

Transfer Information Form on DF/DHF

A) Demographic Information:

1. Name
2. Age
3. Sex
4. Area of residence

B) Brief clinical history

- 1) Duration of Fever and Date of Onset
- 2) Other associated symptoms
Vomiting, Diarrhoea, Abdominal pain
1. Presenting Complaints - in a sequential order
2. Associated co-morbidities
3. Details of drugs and fluid therapy prior to admission

C) Examination findings

1. Clinical status
2. Vital Signs
3. HCT
4. UOP
5. Quantitative Assessment of Overt Bleeding

D) Investigations done

1. FBC (Serial FBCs from prior to admission)
2. AST/ALT
3. CBS (Blood sugar)
4. Blood Group

E) Clinical Course

1. Computation of date and time of entry into the Critical Phase
2. Time scale into critical phase
3. Fluid quota calculated on Ideal/Actual Body Wgt (which ever smaller)

F) Treatment Given

1. Total quantity of Fluid given (oral and iv)
2. Type and amount given
3. If admitted in shock - total fluids used for resuscitation and response to treatment.

G) Reason for transfer

H) Prior contact with transferring institution

I) Type of fluid infusion during transfer

J) Accompanying person to next institutions

Annexure IV

For Measurement of DBE Patients during Critical Phase

Patient to be monitored hourly

Name of the patient: BHT Date and time of admission: ward

Weight: kg Height: cm Bed No: 01

Critical Phase Commencing at 08.00 AM **End of date and time**

Priority to	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
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ECG																									
HR																									
BP																									
SpO ₂																									
Temp																									
CRP																									
Prothrombin time																									
INR																									
Urea																									
Cr																									
UOP																									
UOP > 0.5 ml/kg/h																									
Fluid balance																									
Other																									

For Measurement of Disease Patients - Fabrica Phase (4-6 beds)

Annexure III

Date born	FICT	Sex (M/F)	HR /min	BP mmHg	Pulse /minute	CRFT	Extremity Warm (Cold)	SS	DDP (day Viral culture)	DDP subject	Final Count 10 ⁶	Treatment Remarks

- Anti-emetics and H₂ receptor blockers if necessary
- **Necessarily avoid all NSAIDs in any form and steroids** as they may induce severe bleeding.
- Review daily with Full Blood Count (FBC). **First FBC** should be done on the **third day of fever/illness** and daily thereafter if the platelet count is >150,000/mm³. FBC should be done twice daily if the platelet count is <150,000/mm³. However, a FBC is recommended on the first day of fever/contact in pregnant patients and in patients with co-morbidities.
- **Advise patients/parents to return immediately for review** if any of the following occur on/beyond day three:
 - Clinical deterioration with settling of fever
 - Inability to tolerate oral fluid
 - Severe abdominal pain
 - Cold and clammy extremities
 - Lethargy or irritability/restlessness
 - Bleeding tendency including inter-menstrual bleeding or menorrhagia
 - Not passing urine for more than 6 hours

Differentiation of DHF from DF:

It is important to **differentiate DHF from DF** early because it is the patients with DHF who develop plasma leakage and resultant complications usually after the third day of fever. **DHF may become evident as the fever settles.** Tachycardia without fever (or disproportionate tachycardia with fever) and narrowing of pulse pressure (eg difference between systolic and diastolic narrows from 40mmHg to 30 mmHg) is an early indication of leaking which warrants referral to the hospital. A **progressively rising haematocrit** towards 20% suggests that the patient may have entered the leaking phase.

Clinical and haemo-dynamical stability with no fever for 48 hours indicates recovery from Dengue illness.

Admission to a hospital:

The first contact doctor should decide to admit a patient to a hospital based on the clinical judgment. **It is essential to admit the following patients:**

- Platelet count below <100,000/mm³
- With the following **warning signs** after day 3 of fever/illness:
 - Abdominal pain or tenderness
 - Persistent vomiting
 - Clinical signs of plasma leakage: pleural effusion, ascites
 - Mucosal bleeding
 - Lethargy, restlessness
 - Liver enlargement >2cm
 - Rising HCT with rapid decrease in platelet count in FBC

...admission even without above criteria are:

...mothers - admission on second day of fever and close follow up with daily FBC is very important.

- Elderly patients/infants
- Obese patients
- Patients with co-morbid conditions like diabetes, chronic renal failure, ischemic heart disease, haemoglobinopathies such as thalassaemia and other major medical problems
- Patients with adverse social circumstances -e.g living alone, living far from health facility without reliable means of transport.

Referral to a hospital:

If following features are present refer the patient immediately to a hospital with adequate facilities to manage DHF. Following features may indicate impending shock of DHF after day 3 of illness:

- Clinical deterioration - not improved when no fever/low grade fever
- Abdominal pain
- Persistent Vomiting
- Restless, shortness of breath, persistent crying in infants
- Sweating, cold clammy skin
- Behaviour change, drowsiness
- No passage of urine for 4 - 6 hours

If the patient has signs of shock (e.g. Tachycardia, pulse pressure less than or equal to 20mmHg, and cold extremities etc.) normal saline bolus of 10ml/kg/hr (adults - 500ml) is recommended before referral. Check capillary blood sugar (CBS) for hypoglycaemia and correct with oral or iv Dextrose before referral. Every such transfer should be done after obtaining advice from the Consultant Physician / Paediatrician who will be receiving the patient and after resuscitating in accordance with the advice.

Proper resuscitation before transferring is especially important if the journey is going to take long. Adequate information regarding the patient should be provided in the referral/transfer form and this should include daily fluid balance, all investigation results and treatment given.

Part - B

In-ward Patient Care

Inward patients include patients with both DF and DHF. Differentiation between these two is difficult during the initial few days (first two to three days of fever).

The hallmark of DHF is plasma leakage which is not seen in DF. Plasma leakage is the main cause for shock, subsequent bleeding, organ failure and death.

DHF is diagnosed by early detection of plasma leakage (onset of critical phase). This is usually heralded by detection of rise in the Haematocrit towards 20% (or >20% rise). The objective evidence of pleural effusion or ascites is demonstrated by the presence of free fluid in a Right Lateral Decubitus chest X-ray or Ultrasound examination performed before clinical evidence of free fluid becomes apparent.


Management of Dengue patients should be based on instructions given in the following documents:

1. National Guidelines on Management of Dengue Fever and Dengue Haemorrhagic Fever in Adults
2. National Guidelines on Management of Dengue Fever and Dengue Haemorrhagic Fever in Children and Adolescents.

Heads of healthcare institutions in all areas of the country should take immediate measures to update the knowledge of relevant categories of clinical staff on Management of DHF and DF in consultation with the specialist clinicians serving in their institutions/region.

Further information and technical support can be obtained from the Epidemiological Unit, Colombo 10 (Tel: 011-2681548, 2695112, E-mail: chepid@sltnet.lk, URL: www.epid.gov.lk).

Please bring the contents of this circular to the notice of all officers concerned in your Province/District/Institution/ Unit/ Ward. Also, provide a copy of this circular to relevant individual consultant in your administrative jurisdiction/institution.


Dr. Y.D.N. Jayathilaka
Secretary Health

- c.c. -
1. Additional Secretary (MS)
 2. DGHS
 3. DDG (MS)
 4. DDG (LS)
 5. DDG (PHS)
 6. DDG (ET&R)
 7. Epidemiologist
 8. Director/MRI
 9. D/MSD
 10. D/HE&P
 11. All other Technical DDGs & Directors

Therefore, the mainstay of in-ward care is:

- Early detection of plasma leakage (onset of critical phase)
- Judicious fluid management according to monitoring parameters to prevent shock and fluid overload

Please note that it is essential to refer to the National Guidelines on Management of Dengue Fever and Dengue Haemorrhagic Fever issued in 2010 (and any subsequent revisions/updates) by the Ministry of Health for both Paediatric and Adult patients.

Part - C

Monitoring patients during hospital stay

In the early diagnosis and management of DF/DHF it is important to monitor patients on clinical status, vital signs, serial haematocrits and urine output. This will help early detection of DHF and to assess adequacy of fluid therapy.

Frequency of monitoring of dengue patients has been determined based on the phase of the illness and the rate of leaking. Monitoring of dengue patients should be the collective responsibility of the medical team, both doctors and nursing officers. The treating clinician should ensure that the following monitoring charts are adopted and the patient care is carried out as per the above monitoring parameters.

It is important to ensure a pulse pressure of 30mmHg or more and a urine output of 0.5 - 1.0 ml/kg/hr throughout the critical phase of DHF patients irrespective of the type of fluid administered.

Adult Patient Monitoring:

Annexure I - Observation Chart for Management of Dengue in Adult Patients without evidence of Fluid Leakage (monitor 3 hourly)

Annexure II- Observation Chart for Management of Dengue in Adult patients with Fluid Leakage (monitor hourly and if in shock, resuscitate and monitor more frequently until the patient is stable)

Paediatric Patient Monitoring:

Annexure III - For Management of Dengue Patients - Febrile Phase (monitor 3 hourly)

Annexure IV - For Management of DHF Patients during critical phase (monitor hourly)

Annexure V - to be used during the Peak of leakage and during shock (monitor every 15 minutes until stable)

Part - D

Transferring a patient to another institution

All efforts should be made to manage DHF patients in a Base Hospital or above under the guidance of a consultant. However, facilities in some peripheral hospitals may not be adequate to manage a complicated DHF patient (in prolonged/uncorrected shock with or without organ involvement). Hence, such patients should be managed in a High Dependency Unit (HDU) or Intensive Care Unit.

If the patient has signs of shock (e.g. Tachycardia, pulse pressure less than or equal to 20mmHg, and cold extremities, etc.) normal saline bolus of 10ml/kg/hr (adults - 500ml) is recommended before transfer. Check capillary blood sugar (CBS) for hypoglycaemia.

and correct with oral or iv Dextrose. Every such transfer should be done with a **N-saline infusion** after obtaining advice from the Consultant Physician / Paediatrician who will be receiving the patient.

The transfer form should include the following information:

Please refer **Annexure VI** for Transfer Information Form on DF/DHF. This should include information on the following:

- Demographic Information
- Brief Clinical History
- Examination findings
- Investigations done
- Clinical Course
- Treatment Given
- Type of fluid infusion during transfer
- Reason for transfer

Part - E

The Institutional Dengue Death Review

All dengue related deaths should be immediately reported to the Central Epidemiology Unit by phone/fax/e-mail (during the next working day) following any such death.

It is the responsibility of the head of the institution to carry out a technical dengue death review within one month from the occurrence of all such deaths.

Given as **Annexure VII** is a guide to document details of the death to be completed by the Specialist or the Senior Medical Officer who attended to the patient. These details should be presented at the Institutional Dengue Death Review. Technical support for this review could be obtained from the National Expert Committee of the central Epidemiology Unit. Strict confidentiality should be maintained with regard to this review.

The participants of the institutional dengue death review should be as follows:

1. Head of the Institution or representative
2. Relevant clinicians (Paediatricians/Physicians, etc.)
3. Senior grade medical officers (Registrar/SHO)
4. Relevant House Officers
5. Judicial Medical Officer (JMO)
6. Microbiologist/Histopathologist/Haematologist
7. Hospital Matron
8. Ward sister in-charge
9. Infection Control Nursing Officer
10. Any other relevant officer

A summary report should be made by the head of the institution or by a representative including the conclusions and recommendations of the participants.

Recommendations and comments of the participants with regard to remedial measures should be summarised in this final report. The head of the institution should send a report of the Institutional Death Review to the Central Epidemiology Unit. MOH of the area where the patient resided and the General Practitioner who was involved in primary care should be informed about the findings of this review relevant to them.