Enclosed:

Form I: OPD form for screening of dengue patients
Form II: Suspect Dengue Fever Algorithm
Form III: Identification of Dengue Hemorrhagic Fever Algorithm
Form IV: Algorithm for Fluid Management in Critical Phase
(Including 6 monitoring charts)
Dengue Management Pathway

Patient in OPD (Form I)

Patient in Emergency (Form II)

Admission

Discharge

Ward (Form III)

HDU (Form IV)

Discharge
FORM - I

Services Hospital Lahore

Name ___________________________ s/o d/o w/o _______________ Date: _______________

Age ___________________________ Sex: M / F _______________ Receipt No: _______________

MR # ___________________________

Address & Telephone ___________________________

Warning Signs (one or more)
- No clinical improvement / worsening clinical parameters on Form I
- Persistent vomiting
- Severe abdominal pain
- Lethargy and or restlessness
- Bleeding: severe epistaxis, black stools, hematemesis, extensive menstrual bleeding, hematuria
- Giddiness
- Pale cold clammy extremities
- Loss / no urine output for 4 - 6 hours

If any of the above are present refer patient to emergency department (See Form - II)

Pulse Rate: / Minute
BP:
Pulse Pressure < 20 mm Hg

Tourniquet test +ve -ve

Advised

d # 3 of Fever HCT WBC Platelet
d # 4 of Fever HCT WBC Platelet
d # 5 of Fever HCT WBC Platelet

* If epidemic no need for Dengue IgM and IgG
* IgM and IgG to be done by Elisa in suspected cases only in a non epidemic setting

Dengue IgM and IgG

Reports
IgM IgG

Name, Signature and Date
وزنی بذارکے متعلق پہچانات

مریض اور مرنے کے بارے علیہ دان شن نیم مرنیاں بھرچک دوار کی اسٹائین کر کے

اپنے آپ کی میجر کے کے کے کے کے کے

پائی اور مرنے کا اسٹائین زیادہ سے زیادہ کر کے

کی ایک یاداد کولیائی پار کے نیلے Paracetamol

پہلوں گعلی میں پنچھ پنچھ سے زیادہ کولیائی لین

گلے کے یہ کی پہچان کر

اور دوسری دواروں کی میجر ویپورز کر کے Ibuprofen , Disprin

کبیش کے کروکرٹ سب دکھ وکٹ کر کے CBC with Platelet Count

کہ کھن کھن 24 کے

کروکرین

جم کے کی بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا بکا

لال رینگ کے مشروبات سے گمر زینک کر کے

(Made in Collaboration with Sri Lankan Dengue Experts:
Drs. L. Fernando, K. Sellahewa, H.Tissera, J. Weeraman and WHO guidelines 2011)
Algorithm for Dengue Fever Management in Accident & Emergency Department

If fever > 2 days and < 10 days

Send Complete Blood Count, Platelets, Glucose

Presence of warning signs

Absence of warning signs

List of Warning Signs:
(one or more)

- No clinical improvement / worsening clinical parameters on Form I
- Persistent vomiting
- Severe abdominal pain
- Lethargy and or restlessness
- Bleeding: severe epistaxis, black stools, hematemesis, extensive menstrual bleeding, hematuria
- Giddiness
- Pale cold clammy extremities
- Less / no urine output for 4 – 6 hours

Family education:
Mosquito repellent, no aspirin or NSAIDs, no steroids, no antibiotics, no empiric anti malarials, Paracetamol ≤ 3g/day, tepid water sponging, oral fluids with solutes e.g. juice (avoid red colored fluids)

Prescription

Follow up with CBC and platelets on day 3, 4 & 5 of fever

If rapid platelet fall or warning signs develop

Admit Patient
See guidelines for admitted patients

* Co morbid conditions e.g. pregnancy, very obese patients, extremes of age, Cirrhosis, CRF may warrant early admission at clinicians’ discretion.

(Made in collaboration with SriLankan Dengue Experts Dr. L Fernando, Dr. K Sallehewa, Dr. H Tissera, Dr. J Weeraman and WHO Guidelines 2011)
Identification of Dengue Hemorrhagic Fever

Admission (For DSS See Form IV)
Critical phase (impending critical phase)
Absence of signs of Dengue Hemorrhagic Fever / Dengue Shock Syndrome

Critical phase (day 3 – 7; lasts for 24 – 48 hours)

If any one of these signs is present then go to Form IV for further management

<table>
<thead>
<tr>
<th>Highly suggestive of DHF</th>
<th>Confirmed DHF**</th>
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<tbody>
<tr>
<td>• Disproportionate tachycardia</td>
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<td>• Narrowing of pulse pressure &lt; 20 mm</td>
<td>• Ascites on U/S</td>
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<tr>
<td>• CRFT &gt; 2 secs</td>
<td>• Pleural effusions (CXR right lateral decubitus or chest U/S to detect minimal effusion)</td>
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<tr>
<td>• Tender hepatomegaly (DHF likely)</td>
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<tr>
<td>• Haemoconcentration</td>
<td>** Definitive evidence of plasma leakage</td>
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<td>• Serum albumin &lt; 3.5 g/dl or 0.5 gm/dl fall during illness</td>
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<td>• Non-fasting serum cholesterol &lt; 100 mg/dl or 20mg/dl fall during illness</td>
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<td>• Oedematous gall bladder wall on U/S</td>
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</table>

Management:
Some fluid restriction is essential during the critical phase (24-48hrs)
see:
• Algorithm for fluid management in critical patients
• Flow charts for hourly monitoring

Continue 4 – 6 hourly monitoring
Manage according to flow charts

* Reversal of neutrophil/lymphocyte ratio or reactive lymphocytosis within next 24 hrs is indicative of increased chances of entering the critical phase

Convalescent phase: After the critical phase, lasts 5 – 7 days.
• Good appetite, Convalescent rash, Pruritus, Haemodynamic stability, Bradycardia, Diuresis, Stabilization of HCT, rise in WBC, rise in platelet count. Management: maintain oral intake, antihistamine, rest, discharge

For DSS (Dengue Shock Syndrome) See the pertinent algorithm
(Made in collaboration with SriLankan Dengue Experts Dr. L Fernando, Dr. K Salleh, Dr. T Issera, Dr. J Wesseran and WHO Guidelines 2011)
Interim Guidelines for Management of Dengue Infection SHL/SIMS (To be reviewed after 6 months)

**ALGORITHM FOR FLUID MANAGEMENT IN CRITICAL PHASE**

**Profound shock**
- (BP un-recordable / Pulse not palpable)
- 20ml/kg of 0.9% NaCl bolus
- Pulse still not palpable
- Repeat bolus 10ml/kg of 0.9% NaCl bolus
- (a) Consider colloid (6% starch/dextran 40) 10ml/kg over 1 hr (IV Furosemide 0.5mg/kg midway; monitor for 1 hour)
- HCT fall with 1 bolus of colloid
- ≥ 10 Points + haemodynamic instability
- Bleed

**Shock**
- (Pulse pressure ≤20; pulse palpable)
- 0.9% NaCl 10ml/kg IV rapid (until pulse pressure > 20)
- Pulse pressure still ≤ 20
- Colloid 10ml/kg over 1 hr
- Pulse still not palpable
- Repeat bolus 10ml/kg of 0.9% NaCl bolus
- (a) Consider colloid (6% starch/dextran 40) 10ml/kg over 1 hr (IV Furosemide 0.5mg/kg midway; monitor for 1 hour)
- HCT fall with 1 bolus of colloid
- < 10 Points
- re-examine

**Without shock**
- Pulse palpable; Pulse pressure > 20
- Fluids calculated in 48 hours oral + IV

***b) TOTAL FLUIDS= MAINTENANCE+5% DEFICIT***
- Calculation based on ideal body weight or current weight whichever is lower; Max 50kg

**Patient WT < 50Kg**
- 1st 10 kg → 200ml/kg
- + 2nd 10 kg → 50ml/kg
- + Balance wt → 20ml/kg
- + 5% body wt → 50ml/kg
- Pulse palpable and pulse pressure ≥ 20 mmHg

**Patient WT > 50Kg**
- Maximum fluid
- 4600ml in 48 hours
Interim Guidelines for Management of Dengue Infection SHL/SIMS (To be reviewed after 6 months)

Consider whole blood transfusion (10ml/kg) or packed cell volume (5ml/kg)
(IV Furosemide 0.5mg/kg midway; monitor for 1 hour)

Important:
- Boluses / blood / oral all included in total fluid calculation.
- Shock defined as pulse pressure ≤ 20 mmHg

Note:
*** Infusion rate should vary from 1.5 – 7 ml/kg/hr (IV/oral) keeping an eye on degree of plasma leakage.
Keep urine output 0.5 – 1.0 ml/kg/hr and give fluid accordingly.

**If heading towards fluid overload**: switching to colloids can be needed as higher rate of crystalloids cannot be continued for longer hours

**If patient is not improving consider complications:**

(Made in collaboration with SriLankan Dengue Experts Dr. L Fernando, Dr. K.Sallehewa, Dr.H Tissera, Dr. J Weeraman and WHO Guidelines 2011)

(a) Choice of fluids:

- **Crystalloids:**
  - 0.9% N/S
  - 5% D5W-0.9%N/S
  - < 5 months of age: 5%D5W+0.45% N/S

- **Colloids:**
  - 6% Starch
  - Dextran 40 (When available)
  - Rate of infusion of colloids: 10ml/Kg/Hr
  - ½ bolus in 30 mins or full bolus in 60 mins

(b) Calculation of Ideal Body Weight

- **Best Method:** Weight for height using a growth chart
- **Weight for age using a growth chart**
- **In an emergency situation use these formulae**

| <1 year | Age (in Months) + 9 | 2 |
| >7 years | (Age x 2) + 8 | Age x 3 |
| APLS | (Age + 4) x 2 |

(c) Ideal Body Weight (IBW)

When fluid requirement is calculated (both oral and IV), calculate only for IBW or actual body weight if it is lower than the IBW. The maximum weight for which fluid is calculated in any patient should not exceed 50 kg. Accordingly M+5% should not exceed 4600 ml in any patient.

(d) Calculation of total fluids for critical period

- **M (Maintenance):**
  - 100ml/kg for l° to 10 kg
  - 50 ml/kg for next 10 kg
  - 20 ml/kg for balance wt
- **5% of body weight:**
  - 50ml x body wt (kg)
- **Eg: Body weight 22 kg:**
  - 50 x 22 = 1100 ml
  - M + 5% = 1540
  - 1100 = 2640 ml

This is the total fluid volume this patient will need over the entire critical period irrespective of its length.

(e) Complications: (consider when no improvement)

- **A: Acidosis**
  - Correct acidosis if pH is ≤ 7.35 and if HCO₃ level <15 mmol/L, NaHCO₃ 1ml/kg slow bolus Max. 10ml (can be repeated up to 50ml)

- **B: Bleeding**
  - Consider Whole blood (10 ml/kg) or packed cell (5 ml/kg)

- **C: Hypocalemia**
  - Check serum calcium and QT intervals
  - Give 10% calcium gluconate. Dose 1ml/kg/min, max 10ml at one time, repeat 6 hourly if needed.

- **S: Sugar Levels**
  - Monitor Blood Sugar levels and manage accordingly.

(f) Indications of Furosemide:

- Midway in the infusion of colloids in patients who are already in fluid overload or who are likely to be overloaded depending on the fluids already given.
- Midway between blood transfusions.
- In patients passing less than 0.5ml/kg/hr of urine despite receiving adequate fluids and having stable BP, pulse, Hct to improve the UOP.
- During recovery phase when there is pulmonary oedema or fluid overload.
With Permission From Sri Lankan Dengue Outbreak Response Team

**DENGUE INVESTIGATION SUMMARY**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Age:</th>
<th>Hospital:</th>
<th>Ward:</th>
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<td>BHT:</td>
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<th>Time</th>
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<tr>
<th>WBC - Total</th>
<th>N</th>
<th>L</th>
<th>HCT</th>
<th>Platelet</th>
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<tr>
<th>AST</th>
<th>Blood Urea</th>
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<tr>
<td>ALT</td>
<td>Se.Creatinine</td>
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<tr>
<td>PT / INR</td>
<td>Se. Na⁺</td>
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<tr>
<td></td>
<td>Se. K⁺</td>
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<td></td>
<td>Se.Ca²⁺(ionized)</td>
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<tr>
<th>Date / Time</th>
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<tr>
<th>CXR - R. Decubitus</th>
<th>Se. Albumin</th>
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<td>US Scan</td>
<td>Se. Cholesterol</td>
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<th>pH</th>
<th>HCO₃⁻</th>
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**Other Investigations:**
**Monitoring Chart 1 - for Management of Dengue Patients – Febrile Phase (4–6 hourly)**

<table>
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<tr>
<th>Date/Time</th>
<th>HR (Min)</th>
<th>BP (mmHg)</th>
<th>Pulse Pressure</th>
<th>CRFT Sec</th>
<th>Extremity Warm/Cold</th>
<th>RR</th>
<th>UOP (ml)</th>
<th>UOP (ml/Kg/hr)</th>
<th>HCT</th>
<th>Platelet Count x10⁷</th>
<th>Treatment/Remarks</th>
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With Permission From Sri Lankan Dengue Outbreak response team

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<tr>
<th>Date</th>
<th>Type of Fluid</th>
<th>Starting Time</th>
<th>Rate drop/min</th>
<th>Ending Time</th>
<th>Total Amount Absorbed</th>
<th>Note</th>
<th>Signature</th>
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Name

Age

HN

AN

Department

Ward

Attending Physician
Radiology Request Form
(For suspected Dengue Hemorrhagic Fever)

Name: ___________________ W/o, D/o, S/o: ___________________ Age: __________

Sex: _______ Date: ___________ Ward: ___________________ MRN No: ___________

History:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Ultrasound:
Abdomen and pelvis to detect ascites
__________________________

Chest to detect pleural effusion
__________________________

X-Ray Chest:
Right lateral decubitus to detect minimal pleural effusion
__________________________

PA view to assess pleural effusion
__________________________

Report by Radiologist:

________________________________________________________________________
________________________________________________________________________

Name & Signature