



# Standard Treatment Workflow (STW) for the Management of SEPSIS AND SEPTIC SHOCK IN CHILDREN

## ICD-A41.9, R65.21

### WHEN TO SUSPECT (2-59 MONTHS)?

**Sepsis to be suspected:** in children with any infections (fever with or without rashes/ pneumonia/ diarrhoea) and they are at risk of life threatening organ dysfunction



Poor Feeding	Lethargy	Decreased responsiveness	Unconsciousness
Cold/ bluish peripheries	Rapid or shallow breathing	Chest in drawing	Stridor
Excessive vomiting	Decreased urine output	Convulsions	Stiff neck

### CHECK FOR HISTORY OF

Prior treatment
Previous recurrent infections
Prior hospitalisation
Chronic systemic illness (congenital or acquired)
Immunization (age appropriate)

### EXAMINATION

#### GENERAL PHYSICAL EXAMINATION

#### VITAL SIGNS

#### SYSTEMIC EXAMINATION

Lethargy	Petechial rash
Decreased alertness	Mucosal bleeding
Activity	Rapid breathing
Pallor	Chest in drawing
Cyanosis	Cold peripheries
Skin mottling	Assess nutritional status

Pulse volume (High volume as well as low volume/feeble pulse)	Heart rate and respiratory rate (outside the age range)
Capillary refilling time > 3 seconds	Pulse oximetry (saturation <95%)
Blood pressure* (Systolic blood Pressure < 70 in <1 year)	>1 year child if systolic BP < 70+ Age (yrs) x2) or ( lower than age range)

**Respiratory:** Signs of respiratory distress - retraction, nasal flaring, grunting, crepitation on auscultation  
**CVS:** Murmur, gallop rhythm  
**Per abdomen:** Abdominal distension  
**CNS:** \*AVPU scale, signs of meningitis, seizures  
**Skin:** Rashes  
**Bone & joints:** Swelling, redness, tenderness

#### SIGNS OF SEVERE DEHYDRATION

**Diarrhoea plus any two of these:** Lethargy or unconscious, not able to drink or drinks poorly, Sunken eyes, skin pinch goes back very slowly

#### INVESTIGATIONS- (Based on symptoms and available facility)

**Essential** - Complete blood counts, peripheral blood film, urine routine, blood sugar, CRP, serum electrolytes, renal function test, liver function test

**Desirable** - Blood culture, blood gas, relevant cultures (based on symptoms), chest X-ray, specific illness- Malaria - rapid malarial antigen test, Dengue- dengue NS1, IgM, CSF study

**Optional**- PCT, USG to guide the fluids

### MANAGEMENT

#### DIAGNOSTIC ALGORITHM

CHILD (2-59 MONTHS OF AGE WITH FEBRILE ILLNESS (WITH WARNING SIGNS))

#### GOOD PERIPHERAL PERFUSION

Admit or initiate treatment as per IMNCI guidelines<sup>2</sup>

#### POOR PERIPHERAL PERFUSION\*\*

With fast pulse, cold peripheries, poor pulse volume, CRT >3 seconds (Fast pulse: HR > 180 in < 12 month old child, HR >120 in >12 month old child)

Admit, initiate treatment, refer to centre with facility of ICU, ventilation, 24 hour monitoring (if required)

Start O<sub>2</sub> with face mask @ 4-6 lit/min, or hood @8-10 lit if not available nasal prongs 1-2 lit/min to maintain SpO<sub>2</sub> >95%, Insert two IV cannulas, give first dose of antibiotics within first one hour

Give 20 ml/kg of normal saline fluid bolus over 20- 30 minutes.

Reassess for decreases in heart rate, improvement in pulse volume and warm peripheries

If no improvement

Repeat bolus of 20 ml/kg over 30 minutes, with careful monitoring for hepatomegaly, oxygen saturation, crepitation's in chest (if any of above appears then stop fluids)

If shock persists

Start Inj Adrenaline infusion @0.1 microgram/kg/min and refer to higher center

#For severe acute malnutrition - consider SAM STW  
 #For suspected Dengue follow Dengue Fever STW

\*\*If there is improvement after 1st bolus and history of diarrhea present then:

Give 70 ml/kg over 5 hours in infants and over 2 ½ hours in a child with hypovolemic shock. Give additional fluids if losses continue.

Start maintenance fluid in case of other illness

#### Antibiotics

- >3 months Inj Ceftriaxone 100mg/kg/day ( 2 divided doses)
- <3 month Inj Cefotaxime 200mg/kg (divided 6-8hrly), Inj Gentamicin 5-7.5 mg/kg single dose /day
- If soft tissue infection: consider Inj Cloxacillin 200mg/kg divided 6 hourly or Inj Amoxicillin- Clavulanic acid 30 mg/kg/dose 8hrly)

Inj Adrenaline- 0.3x body weight in mg in 50 ml NS or 5% dextrose at 1 ml/hr will give 0.1 microgram/kg/min

#### When to refer

- Shock does not improve after 2nd fluid bolus
- Signs of fluid overload
- No facility for continuous monitoring.
- Before referral counsel the parents and inform referring facility

#### When to Suspect Cardiac Failure

- History of underlying heart disease
- History of forehead sweating/ suck rest suck cycle
- Murmur
- Hepatomegaly or basilar crept

If it is suspected be careful in giving fluid bolus

#### Complications

- Respiratory failure** ( excessive increase in the respiratory rates and inability to maintain saturation > 94% with oxygen) -non-invasive (CPAP/BIPAP) or invasive ventilation
- Congestive heart failure**- Dobutamine / Milrinone infusion and Furosemide
- Infections on other sites**- explore and treat accordingly

### DISCHARGE CRITERIA

Completion of antibiotics as per culture sensitivity

Afebrile for 48 hours

Vitals within normal limit for age

Good oral intake

Adequate urin output >1ml/kg/hr

### KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

#### \*DISABILITY (AVPU SCALE)

**A** Is the child Alert? If not; **V** Is the child responding to Voice? If not; **P** Is the child responding to Pain?; **U** The child who is Unresponsive to voice (or being shaken) AND to pain is Unconscious \*Anything below A should be classify as danger sign