

STANDARD TREATMENT WORKFLOW (STW)

Sepsis and Septic Shock in Children

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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	Pulse volume (High volume as well as low volume/feeble pulse)	Heart rate and respiratory rate (outside the age range)	Respiratory: Signs of respiratory distress - retraction, nasal flaring, grunting, crepitation on auscultation
Decreased alertness	Mucosal bleeding			

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EXAMINATION

GENERAL PHYSICAL EXAMINATION	VITAL SIGNS	SYSTEMIC EXAMINATION
Lethargy	Pulse volume (High volume as well as low volume/feeble pulse)	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
Petechial rash	Heart rate and respiratory rate (outside the age range)	
Decreased alertness	Capillary refilling time > 3 seconds	
Mucosal bleeding	Blood pressure* (Systolic blood Pressure < 70 in <1 year)	
Activity		
Rapid breathing		
Pallor		
Chest in drawing		
Cyanosis		
Cold peripheries		
Assess nutritional status		

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
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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 guidelines²

****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 Centamicin 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

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 O₂ with face mask @ 4-6 lit/min, or hood @8-10 lit if not available nasal prongs 1-2 lit/min to maintain SpO₂ >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.

Reasons 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 centre

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

When to refer	When to Suspect Cardiac Failure	Complications
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> History of underlying heart disease History of forehead sweating/ suck rest suck cycle Murmur Hepatomegaly or basilar crept <p>If it is suspected be careful in giving fluid bolus</p>	<ul style="list-style-type: none"> 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 urine output >1ml/kg/hr
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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

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information.
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