STANDARD TREATMENT WORKFLOW (STW)

Sepsis and Septic Shock in Children

Shally Awasthi[1], Sushil Kabra[2], Neelam Mohan[3], Pushpa Kini[4], Suvasini Sharma[5], Joseph Mathew[6], Surjit Singh[7], Kuldeep Singh[8], Himanshu Chaturvedi[9], Shinjini Bhatnagar[10]

[1]King George's Medical University, Lucknow; [2]All India Institute Of Medical Science, New Delhi; [3]Medanta, Gurgaon; [4]Kasturba Medical College, Manipal; [5]Lady Hardinge Medical College, New Delhi; [6]Postgraduate Institute of Medical Education and Research, Chandigarh; [7]Postgraduate Institute of Medical Education and Research, Chandigarh; [8]All India Institute Of Medical Science, Jodhpur; [9]Balrampur Hospital, Lucknow; [10]Translational Health Science and Technology Institute (THSTI), Faridabad

CORRESPONDING AUTHOR

Dr. Shally Awasthi, Professor & Head, Department of Paediatrics, King George's Medical University, Lucknow Uttar Pradesh 226003

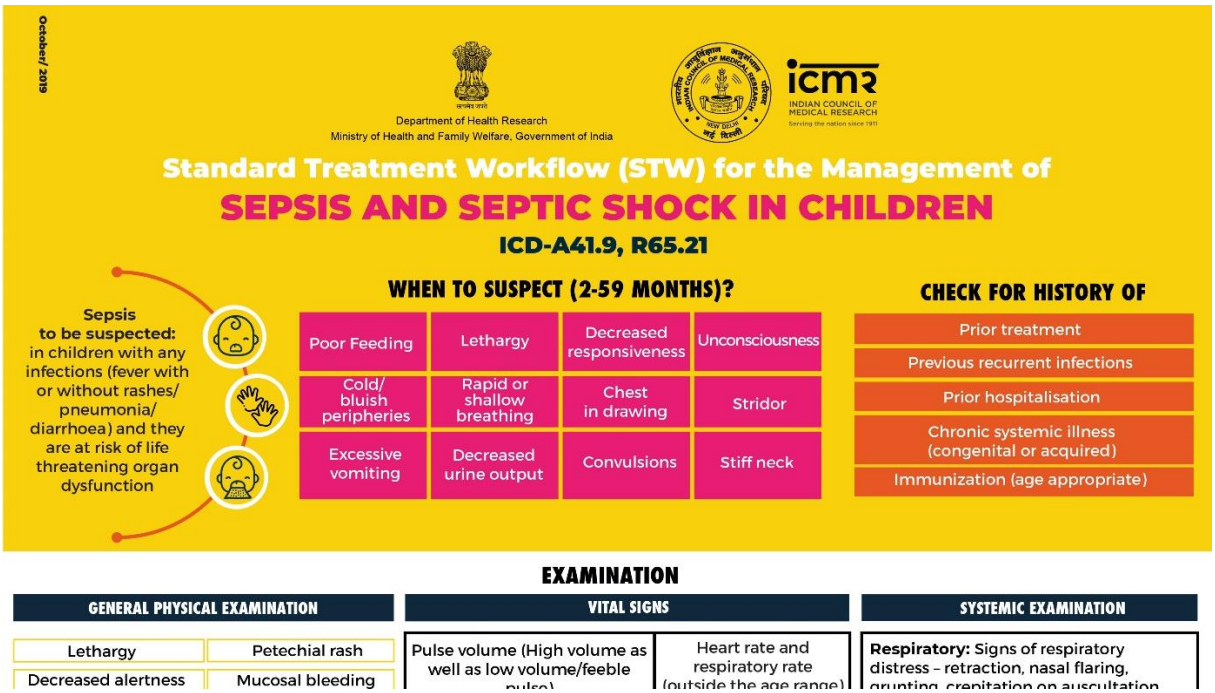
Email: shally07@gmail.com

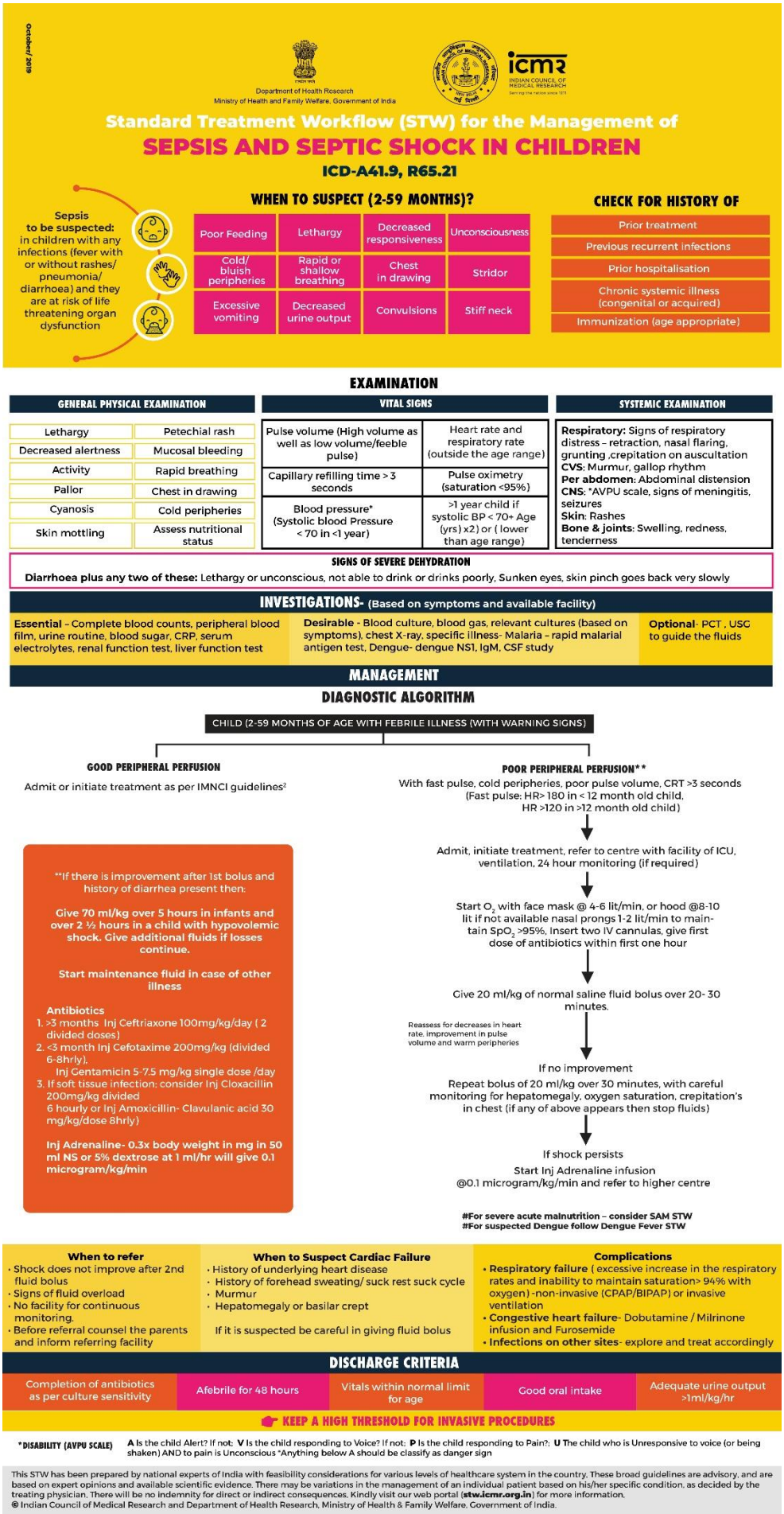
CITATION

Awasthi S, Kabra S, Mohan N, Kini P, Sharma S, Mathew J, Singh S, Singh K, Chaturvedi H, Bhatnagar S. Sepsis and Septic Shock in Children. Journal of the Epidemiology Foundation of India. 2024;2(1Suppl):S09-S10. DOI: https://doi.org/10.56450/JEFI.2024.v2i1Suppl.005

DISCLAIMER

This article/STW, was originally published by Indian Council of Medical Research (ICMR) under Standard Treatment Workflow. The reprinting of this article in Journal of the Epidemiology Foundation of India (JEFI) is done with the permission of ICMR. The content of this article is presented as it was published, with no modifications or alterations. The views and opinions expressed in the article are those of the authors and do not necessarily reflect the official policy or position of JEFI or its editorial board. This initiative of JEFI to reprint STW is to disseminate these workflows among Health Care Professionals for wider adoption and guiding path for Patient Care.




October 2019
Department of Health Research
Ministry of Health and Family Welfare, Government of India
icmr
INDIAN COUNCIL OF MEDICAL RESEARCH
Standard Treatment Workflow (STW) for the Management of
SEPSIS AND SEPTIC SHOCK IN CHILDREN
ICD-A41.9, R65.21
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
WHEN TO SUSPECT (2-59 MONTHS)?
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
Lethargy
Petechial rash
Decreased alertness
Mucosal bleeding
Activity
Rapid breathing
Pallor
Chest in drawing
Cyanosis
Cold peripheries
Skin mottling
Assess nutritional status
VITAL SIGNS
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)
SYSTEMIC EXAMINATION
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 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
1. >3 months Inj Ceftriaxone 100mg/kg/day (2 divided doses)
2. <3 month Inj Cefotaxime 200mg/kg (divided 6-8hrly).
Inj Gentamicin 5-7.5 mg/kg single dose /day
3. 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 O_2 with face mask @ 4-6 lit/min, or hood @8-10 lit if not available nasal prongs 1-2 lit/min to maintain SpO_2 >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 centre
#For severe acute malnutrition – consider SAM STW
#For suspected Dengue follow Dengue Fever STW
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 urine 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
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.
© Indian Council of Medical Research and Department of Health Research, Ministry of Health & Family Welfare, Government of India.