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Department of Health Research
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INDIAN COUNCIL OF MEDICAL RESEARCH
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# Standard Treatment Workflow (STW) for the Management of

# NEUROINFECTIONS

## ICD-10-G03.9

### SYMPTOMS

Acute onset-hours to days

Alteration in sensorium

With/ without fever/ headache/vomiting/seizures

### DIFFERENTIAL DIAGNOSIS

- Vascular-ischemic/hemorrhagic stroke
- Infections viral/bacterial/fungal/protozoal meningoencephalits/brain abscess
- Metabolic encephalopathies
- Seizures/postictal state
- Intoxications-drugs/toxins

## AT PRIMARY CARE LEVEL

### ESSENTIAL

- Check Airway/Breathing/Circulation
- Rule out circulatory shock, ongoing convulsions and hyperthermia/hyperpyrexia(core temperature > 40.5˚C or hypothermia(< 36.5˚C)
- Establish IV access-urgent blood for hemogram/sugar/electrolytes/malaria testing-peripheral smear/rapid antigen detection
- Correct hypoglycemia (blood sugar 50 mg/dl) with IV 100ml of 25% dextrose solution
- If seizing- IV/IM Lorazepam 0.1 mg/kg followed by loading with Phenytoin 20 mg/kg weight at a rate of 50 mg/minute
- When IV access not available-intra nasal or buccal Midazolam 0.2 mg/kg /intra rectal Diazepam 0.3-0.4 mg/kg
- Urgent referral to higher centres with intensive care facilities

### NOT RECOMMENDED

- Stomach wash
- Inj Mannitol
- Inj Steroids

### CRITERIA FOR REFERRAL

Altered sensorium/seizures /focal deficits/hemodyna mic instability –where imaging and ICU management are required.

## AT SECONDARY CARE LEVEL( TALUK, DISTRICT) HEADQUARTERS HOSPITAL

### ESSENTIAL

In addition to all the steps given above :

- Establish and maintain airway: Intubate if GCS<8, impaired airway reflexes, abnormal respiratory pattern, signs of raised ICP, oxygen saturation <92% despite high flow oxygen, and fluid refractory shock
- Inj Thiamine 100 mg IV
- Stomach wash/activated charcoal administration-if history or suspicion of drug overdose/ non corrosive poison intake
- Start treatment for cerebral malaria-first dose of IV Artesunate 2.4 mg/kg OR Quinine 20 mg/kg bolus
- Emergency CT/referral to centre with 24 hour CT facilities

### DESIRABLE

- Neuroimaging-CT with contrast -to rule out hemorrhage/infarcts/focal edema or lesions
- Blood cultures aerobic/anaerobic
- First dose of empirical treatment of pyogenic meningitis-Inj Ceftriaxone 2 g + Inj Vancomycin 500 mg.
  Add Inj Ampicillin 2 g if older than 50 years / immunocompromised along with Inj Dexamethasone 8 mg
- Fundus examination,CSF study to rule out meningoencephalitis-if imaging rules out any mass lesions/herniations.
- Urgent referral to higher centres with Intensive care facilities

### CRITERIA FOR REFERRAL

- Altered sensorium/seizures/focal deficits/hemodynamic instability –where imaging and ICU management are required.
- If no definite diagnosis achieved after preliminary investigations

## AT TERTIARY CARE HOSPITALS-SELECTED DISTRICT HOSPITALS/MEDICAL COLLEGES

- Neuroimaging-MRI/CT with contrast to rule out abscess/herniations.
  If abscess-emergency neurosurgical consultation for favour of aspiration –open/stereotactic
- Blood cultures-aerobic/anaerobic
- CSF analysis-biocehmistry/cytology/gram staining/culture-bacterial , AFB and fungal/viral PCR/TB-PCR/fungal antigen

**Empirical antibiotic (within 30 minutes of arrival)**

- If suspecting pyogenic meningitis-Inj Ceftriaxone 2 g+ Inj Vancomycin 500 mg+ Inj Ampicillin 2 g if older than 50 years or immunocompromised+ Inj Dexamethasone 8 mg IV
- Continue empirical treatment till culture yields causative organism,then tailor treatment as per sensitivity reports for 10-14 days.
- Steroids to be stopped after 48 hours,unless any other compelling indications-adrenal insufficiency/TBM

**Viral-Herpes simplex/Zoster**

- Inj Acyclovir 500 mg IV 8 hourly for 10 days

**Cerebral malaria**

Inj Artesunate 2.4 mg/kg IM or IV 3 doses 12 hours apart and then OD /
Inj Quinine 20 mg/kg IV stat followed by 10mg/kg TDS till patient can take orally,then oral Artesunate+Pyrimethamine /Sulphadoxine for 3 days OR oral Quinine 10 mg/kg TDS for total 7 days + Doxycycline 3 mg/kg OD for 7 days.

### COMPLICATIONS

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| Raised ICP | SIADH | Vasculitis | Hydrocephalus |

*If uncomplicated-back referral to Secondary care centre for completing treatment regimen/monitoring.

### CRITERIA FOR DISCHARGE

| | | |
|---|---|---|
| Afebrile,hemodynamically stable,seizure free >48 hours | Diagnosis and treatment plan made and initiated. | Continuation of treatment with monitoring can be ensured for the prescribed duration. |

## KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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.