



# **GUIDELINES**

## **CLINICAL MANAGEMENT OF ACUTE ENCEPHALITIS SYNDROME INCLUDING JAPANESE ENCEPHALITIS**



सत्यमेव जयते

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## PREFACE

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Following outbreak of Japanese Encephalitis (JE) in Gorakhpur and Basti divisions in Eastern Uttar Pradesh during 2005, directorate National Vector borne Disease Control Programme developed surveillance guidelines and issued the same to all JE endemic states with the advice that JE be commonly reported under Acute Encephalitis Syndrome and after getting the confirmation from the Sentinel sites, a line list of JE cases be drawn and sent along with the prescribed formats.

AES including JE is reported mainly from Assam, Bihar, Karnataka, Tamil Nadu and Uttar Pradesh which contributes approximately 80% of cases and deaths respectively with a case fatality rate ranging from 20 to 25%. Specific anti-viral drug for AES including Japanese Encephalitis is not available till date and cases are managed symptomatically. In the wake of repeated outbreaks witnessed in the past, Directorate of NVBDCP has already taken steps to strengthen the system of disease surveillance. JE surveillance which is a component of AES surveillance has been instituted with the establishment of sero-surveillance network. Vaccination for prevention of JE is being undertaken under Universal Immunization Programme.

Prompt and effective case management needs more improved inputs viz service from health care providers (medical and paramedical), laboratory facilities for diagnosis of JE cases and sufficient availability of drugs and equipment in treatment centres. Infrastructure of clinical management with Standard Operating Procedure / guidelines for management of cases should be available at District/CHS/PHC level. Experience gained from recent outbreaks has shown that due to lack of common understanding at all levels of health care delivery system there was confusion about management of cases and their timely referral.

These guidelines have therefore been prepared by the Directorate of NVBDCP for management of AES that includes Japanese Encephalitis cases as well. They are intended to guide the management of acutely ill children, especially those with fever, or loss of consciousness, convulsions, or other symptoms suggesting meningitis or encephalitis. They clearly outline issues like education of village level worker community for early referral of suspects and care at the time of transportation which contributes immensely in reducing CFR. **The main cause of high mortality is transporting patient over long distances without proper medical care in the hope of getting best treatment in the tertiary care hospital. Lack of First Aid during this long and time consuming transport is damaging the brain to an irreversible way. Medicare must be provided at the nearest hospital at the earliest<sup>1</sup>.** A broad framework for management of patients with encephalitis has been laid down with the aim to improve clinical practices which have a bearing on patient outcome and recovery.

It is sincerely hoped that this document will guide clinicians at all levels to strengthen JE case management.

The revised guidelines on case management of AES have been prepared in consultation with Dr. P.Nagabhushana Rao, international expert on the management of AES and Dr. V.K. Gupta, Prof. & HOD, Deptt. Of Pediatrics, RML Hospital along with expert clinicians drawn from different health care institutions in the country.

**(G.P.S. DHILLON)**  
Director

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## 1. INTRODUCTION

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Acute Encephalitis Syndrome (AES) including Japanese Encephalitis (JE) is a group of clinically similar neurologic manifestation caused by several different viruses, bacteria, fungus, parasites, spirochetes, chemical/ toxins etc. There is seasonal and geographical variation in the causative organism. The outbreak of JE usually coincides with the monsoon and post monsoon period when the density of mosquitoes increases while encephalitis due to other viruses specially entero-viruses occurs throughout the year as it is a water borne disease. The encephalitis by Arbovirus of North America includes the newly introduced West Nile Encephalitis (WNE). The case fatality and morbidity is very high among various viral encephalitis specially in JE or entero-virus encephalitis in various parts of India.

For surveillance purposes, all the cases of Acute Encephalitis Cases to be reported under the heading of “acute encephalitis”. In the WHO’s guidelines for JE surveillance, syndromic surveillance for JE is recommended. This means that all cases of Acute Encephalitis Syndrome (AES) should be reported. Laboratory confirmation of suspected cases can be done where feasible. The following case definition should be used for reporting of suspected AES cases in endemic areas:

### 1.1 Case definition of Acute Encephalitis Syndrome (AES)

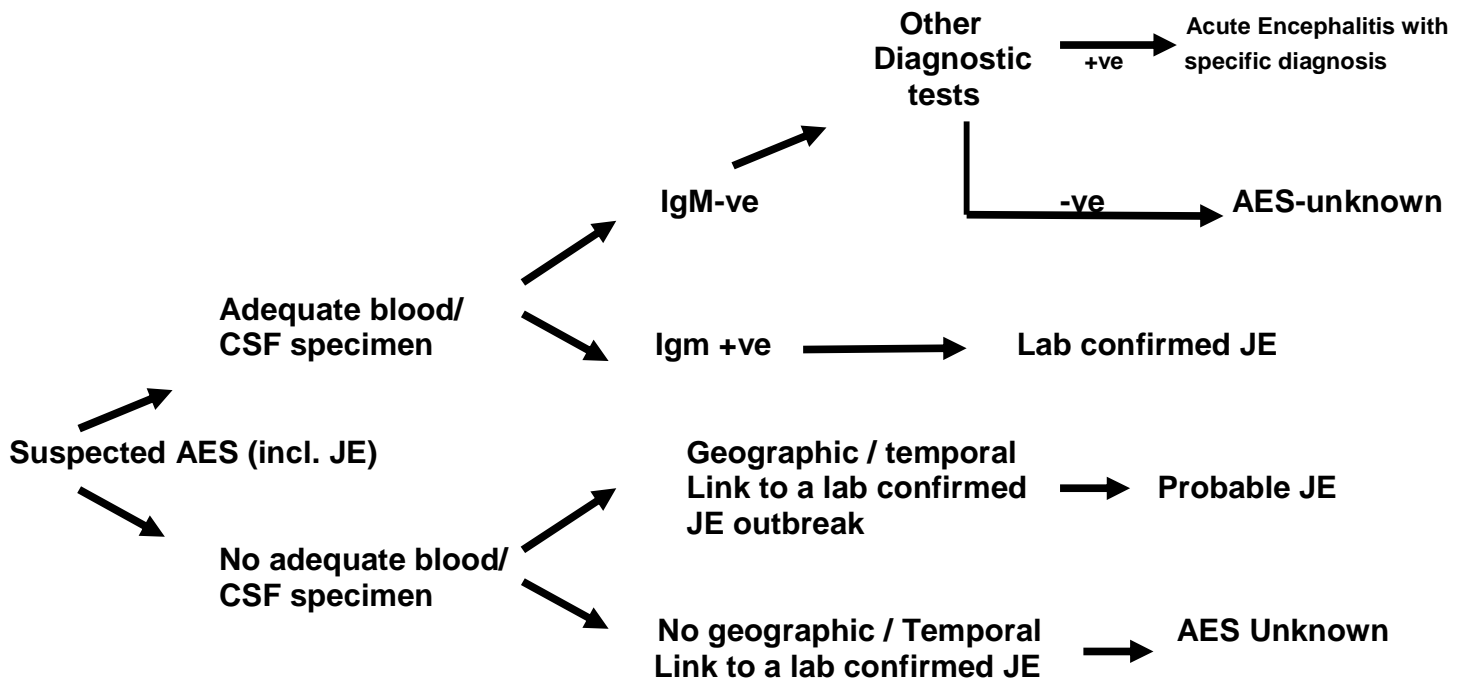
Clinically, a case of AES is defined as a person of any age, at any time of year with the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) AND/OR new onset of seizures (excluding simple febrile seizures). Other early clinical findings may include an increase in irritability, somnolence or abnormal behaviour greater than that seen with usual febrile illness.

### 1.2 Case classification

A case that meets the clinical case definition for AES i.e. suspected case should be classified in one of the following four ways (see Figure 1):

- a) Laboratory-confirmed JE: A suspected case that has been laboratory-confirmed as JE.
- b) Probable JE: A suspected case that occurs in close geographic and temporal relationship to laboratory-confirmed case of JE, in the context of an outbreak.
- c) “Acute encephalitis syndrome” (due to agent other than JE): A suspected case in which diagnostic testing is performed and an etiological agent other than JE virus is identified.
- d) “Acute encephalitis syndrome” (due to unknown agent ) A suspected case in which no diagnostic testing is performed or in which testing was performed but no etiological agent was identified or in which the test results were indeterminate.

**FIGURE 1 : FINAL CLASSIFICATION SCHEME FOR AES CASES**



While the above classifications are useful for clearer definitions of AES cases, for practical purposes, the two key definitions to be used are “Suspected JE Cases” for those that meet the criteria for AES, and “confirmed JE cases” for those AES cases which have laboratory confirmation for JE.

Japanese Encephalitis (JE) is a mosquito borne zoonotic viral disease is one of the causes under AES. The virus is maintained in animals and birds. Pigs and birds, particularly the birds belonging to Family Ardeidae (e.g. cattle egrets, pond herons, etc.) are the natural hosts. Pigs and wild birds are reservoir of infection and are often called as “amplifier hosts” in the transmission cycle, while man and horse are ‘dead end’ hosts. Similarly other virus, fungus, parasite, spirochetes, toxin etc may cause similar illness.

The disease affects the central nervous system and can cause severe complications, seizures and even death. The case fatality rate of this disease is very high and those who survive may suffer with various degrees of neurological sequelae. Children suffer the highest attack rates because of lack of cumulative immunity due to natural infection.

Meningitis, caused by bacteria, can be treated as soon as possible with antibiotics. Encephalitis, usually caused by a virus, cannot be treated with antibiotics. However, good clinical management is important to reduce the risk of disability or death from the disease.

Clinical involvement of the Central Nervous System (CNS) is an unusual manifestation of human viral infection. The spectrum of brain involvement and the outcome of the disease are dependent on the specific pathogen, the immunological state of the host and a range of environmental factors. Although specific therapy is limited to only several viral agents, correct diagnosis, and supportive and symptomatic treatment (when no specific therapy is available) are mandatory to ensure the best prognosis.

These guidelines have been prepared by the Directorate of NVBDCP for management of AES including Japanese Encephalitis cases in consultation with national experts. The list of the contributors may be seen at Annexure 5. The guidelines are intended to guide the management of acutely ill children, especially those with fever, a change in consciousness, convulsions, or other symptoms suggesting meningitis or encephalitis.

## 2. DIAGNOSIS OF JAPANESE ENCEPHALITIS

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### Objectives

1. Learn the case definition and common sign and symptoms and management especially at the peripheral level.

### 2.1 Clinical Manifestations

Following an incubation period, in case of viral encephalitis including JE a prodrome of fever, headache, nausea, diarrhoea, vomiting, and myalgia occurs lasting for few days (1-5 days) followed by irritability, altered behaviour, convulsions and coma. The progression of disease is rapid. Signs of raised intra cranial tension are commonly present in acute stage of illness. The patient may develop difficulty of speech and other neurological deficits like ocular palsies, hemiplegia, quadriplegia and extrapyramidal signs in the form of dystonia, choreoathetosis and coarse tremors.

All the cases of Acute CNS involvement are reported in the syndrome of acute encephalitis i.e. all cases of Acute Encephalitis Syndrome (AES) should be reported as they have similar clinical manifestations. Their case management usually follows a common protocol along with situation specific treatment. Diagnosis of JE will depend on laboratory investigations. The case definitions and case classification in the programme are given in the following paragraphs.

### 2.2 Case Definition of Suspected case:

- Acute onset of fever, not more than 5-7 days duration.
- Change in mental status with/ without
  - New onset of seizures (excluding febrile seizures)
  - (Other early clinical findings – may include irritability, somnolence or abnormal behavior greater than that seen with usual febrile illness)

### **Important**

- In an epidemic situation fever with altered sensorium persisting for more than two hours with a focal seizure or paralysis of any part of body, is encephalitis.
- Presence of rash on body excludes Japanese Encephalitis.
- AES with symmetrical signs and fever is likely to be cerebral Malaria.

## 2.3 Case Classification:

**Laboratory-Confirmed case :** A suspected case with any one of the following markers:

- Presence of IgM antibody in serum and/ or CSF to a specific virus including JE/Enterovirus or others
- Four fold difference in IgG antibody titre in paired sera
- Virus isolation from brain tissue
- Antigen detection by immunofluorescence
- Nucleic acid detection by PCR

In the sentinel surveillance network, AES/JE will be diagnosed by IgM Capture ELISA, and virus isolation will be done in National Reference Laboratory.

### Probable Cases

Suspected case in close geographic and temporal relationship to a laboratory-confirmed case of AES/JE in an outbreak

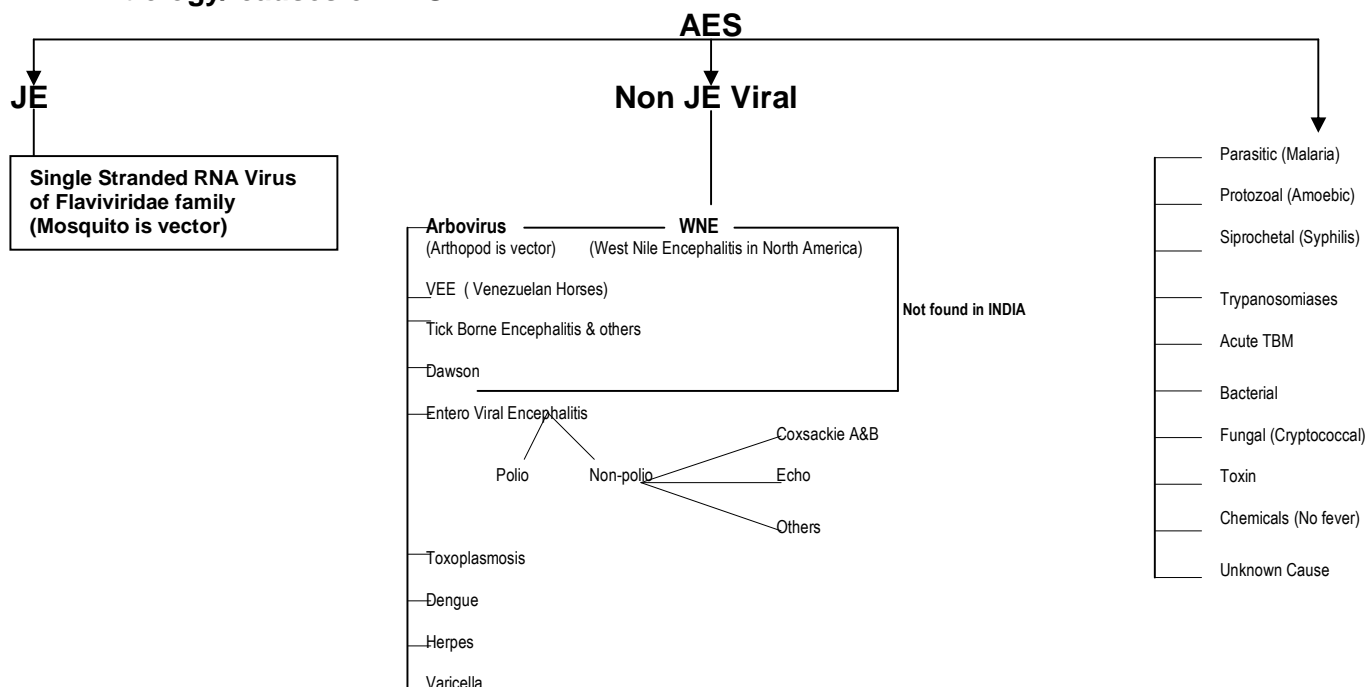
### Acute Encephalitis Syndrome due to other agent

A suspected case in which diagnostic testing is performed and an etiological agent other than AES/JE is identified

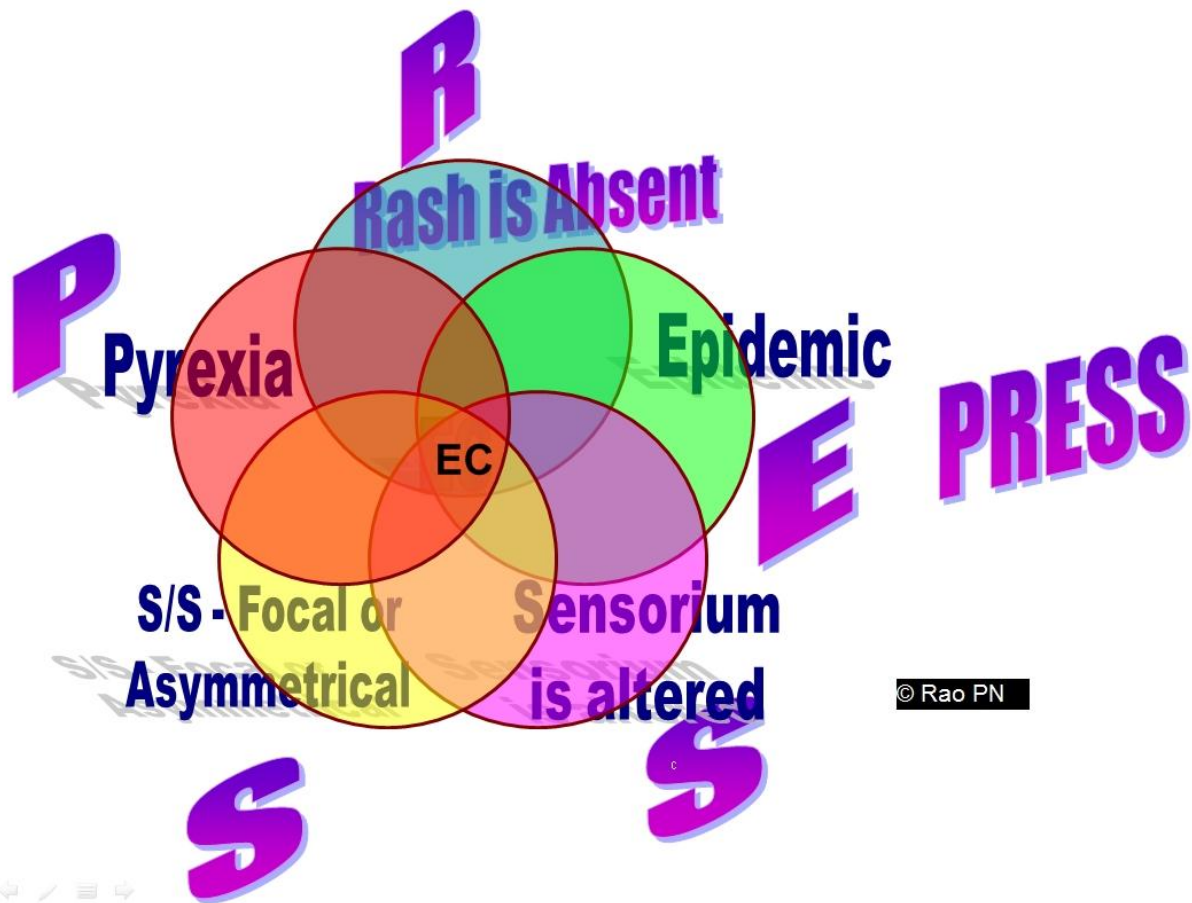
### Acute Encephalitis Syndrome due to unknown agent

A suspected case in which no diagnostic testing is performed / no etiological agent is identified / test results are indeterminate

### Etiology/ causes of AES







EC includes only 2 diseases. JE and Epidemic Brain Attack (EBA)/ Non JE, AES.  
 Diagnosis: EBA can be easily differentiated from JE with the help of the following Table.

**2.4 Differentiation of Japanese Encephalitis and Epidemic Brain Attacks/ NON-JE, AES.**

	<b>Japanese Encephalitis</b>	<b>Epidemic Brain Attack (EBA) or Non JE/ AES</b>
Relation to onset of Rains	About 6 weeks after onset of rains	Starts within 3 days after the onset of rains
Pain in abdomen	No	in 50%
Diarrhea	No	in 50%
CSF	lymphocytic pleocytosis	normal except for increased tension
CT scan	Thalami hypodense	Infarct in Middle cerebral artery territory
MRI scan	Thalami hyperintense	Infarct in Middle cerebral artery territory.

### 3. MANAGEMENT OF ACUTE ENCEPHALITIS SYNDROME (AES) INCLUDING JAPANESE ENCEPHALITIS

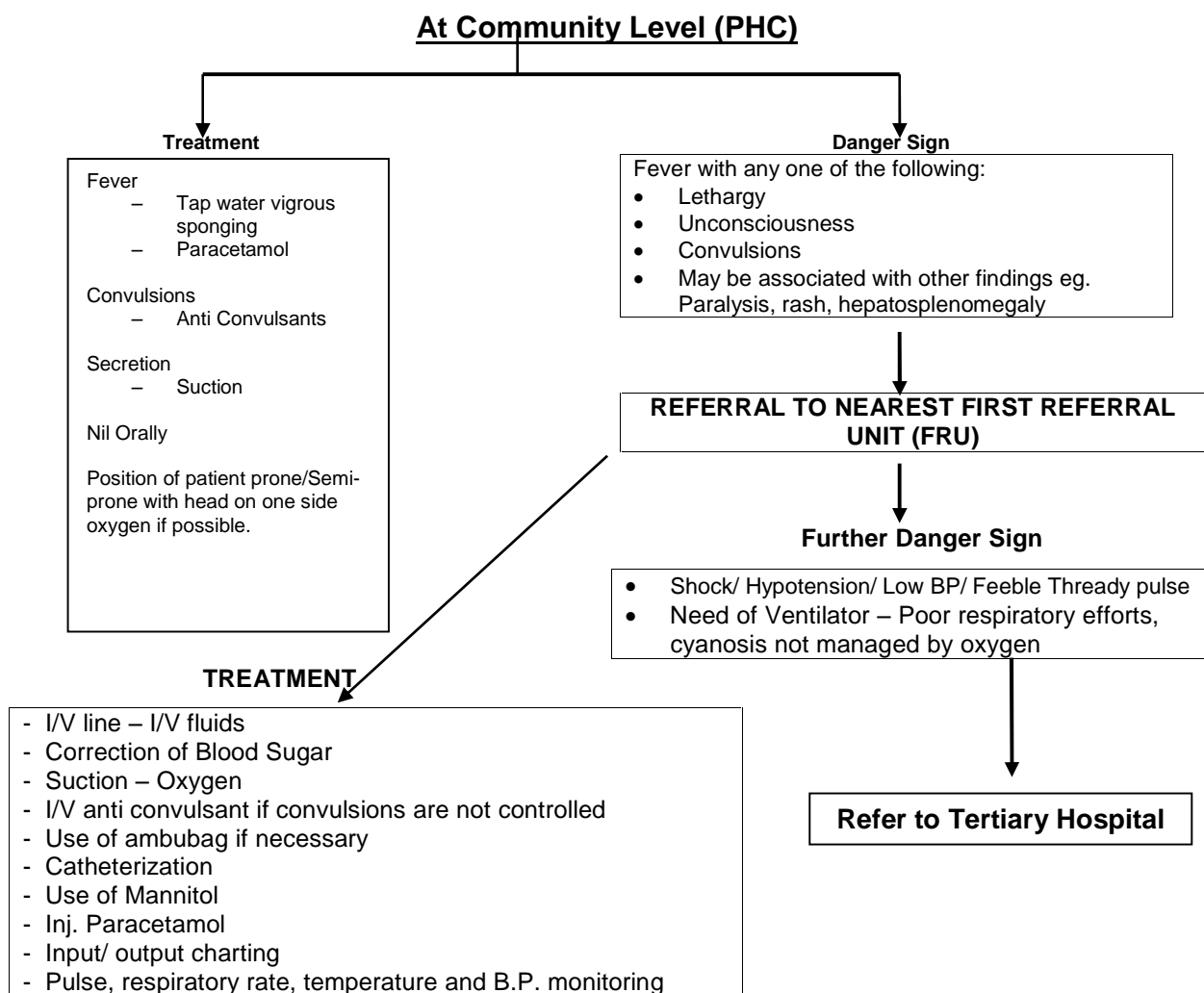
#### Objectives

1. Learn the clinical management of AES.
2. Know the danger signs for referral.

#### 3.1 Danger Sign & Line of Treatment

Management of Acute Encephalitis Syndrome including Japanese Encephalitis is essentially symptomatic. To reduce severe morbidity and mortality, it is important to identify early warning signs and refer patients to health facility and educate the health workers about the first line of management at the grassroots level. Chart 1 depicts what is to be done for a patient at the community level.

**Chart : Management of AES including Japanese Encephalitis**



### 3.2

### MANAGEMENT OF CASES OF AES INCLUDING JE

Treatment at the health facility, it is important to exclude other causes of CNS affliction like meningitis or cerebral malaria which require specific treatment. Treatment will depend on the condition in which patient is received in the health facility. Since patients are likely to arrive with high grade fever and change in mental status or convulsions proceed with the assessment of patency of airway.

The treatment at PHC/ CHC District level or at tertiary care hospitals remains the same. Depending upon the needs of care and availability of facilities available at the centre/ hospital the patients to be transferred to the nearest higher centre for further management. It should be ensured before transferring the case, all the available treatment is provided to the patient. Only needy patients where such facilities are not available, to be transported. The time consumed in transportation itself is a major cause of high mortality rate.

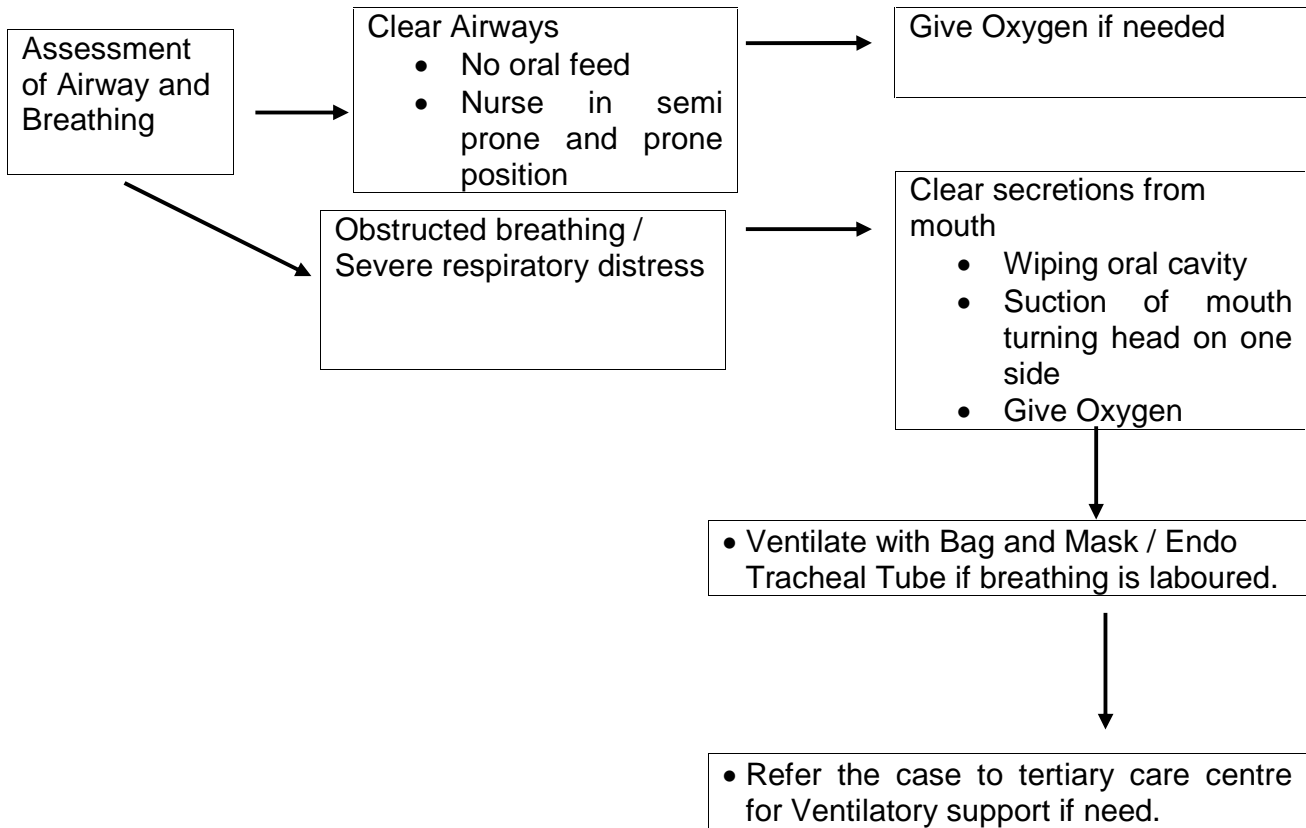
In all endemic areas, all the facilities including training can be arranged before hand except Ventilatory Support. All Centres should be equipped with ambu beg and oxygen in addition to other medicines and I/V cannula.

The treatment of the patients may require, as follow:-

- 1.) Management of Airways and Breathing.
- 2.) Management of Circulation.
- 3.) Control of Convulsion and Intracranial pressure
- 4.) Control of Temperature
- 5.) Fluid and Electrolytes and Calories/ Nutrition
- 6.) General management
- 7.) Specific treatment of any for treatable cause
- 8.) Investigations, Samples Collection & Transportation
- 9.) Reporting of a case
- 10.) Rehabilitation.

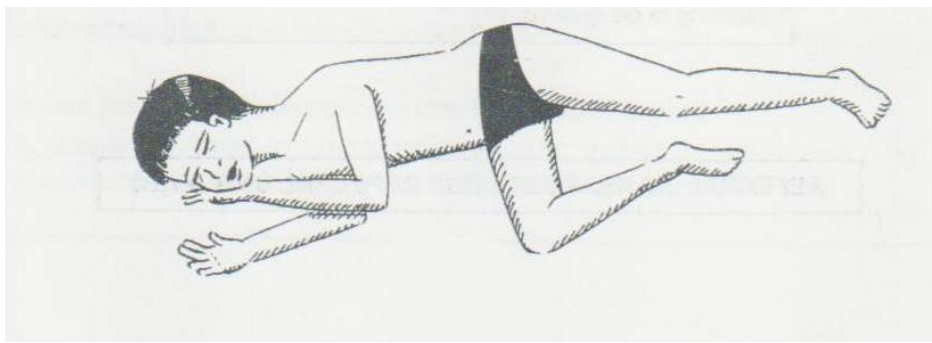
### 3.2.1

## MANAGEMENT OF AIRWAY AND BREATHING



**Fig 1. Position of the Patient**

- Turn the patient on the prone side to reduce risk of aspiration.
- Keep the neck slightly extended and stabilize by placing cheek on one hand.
- Bend one leg to stabilize the body position.

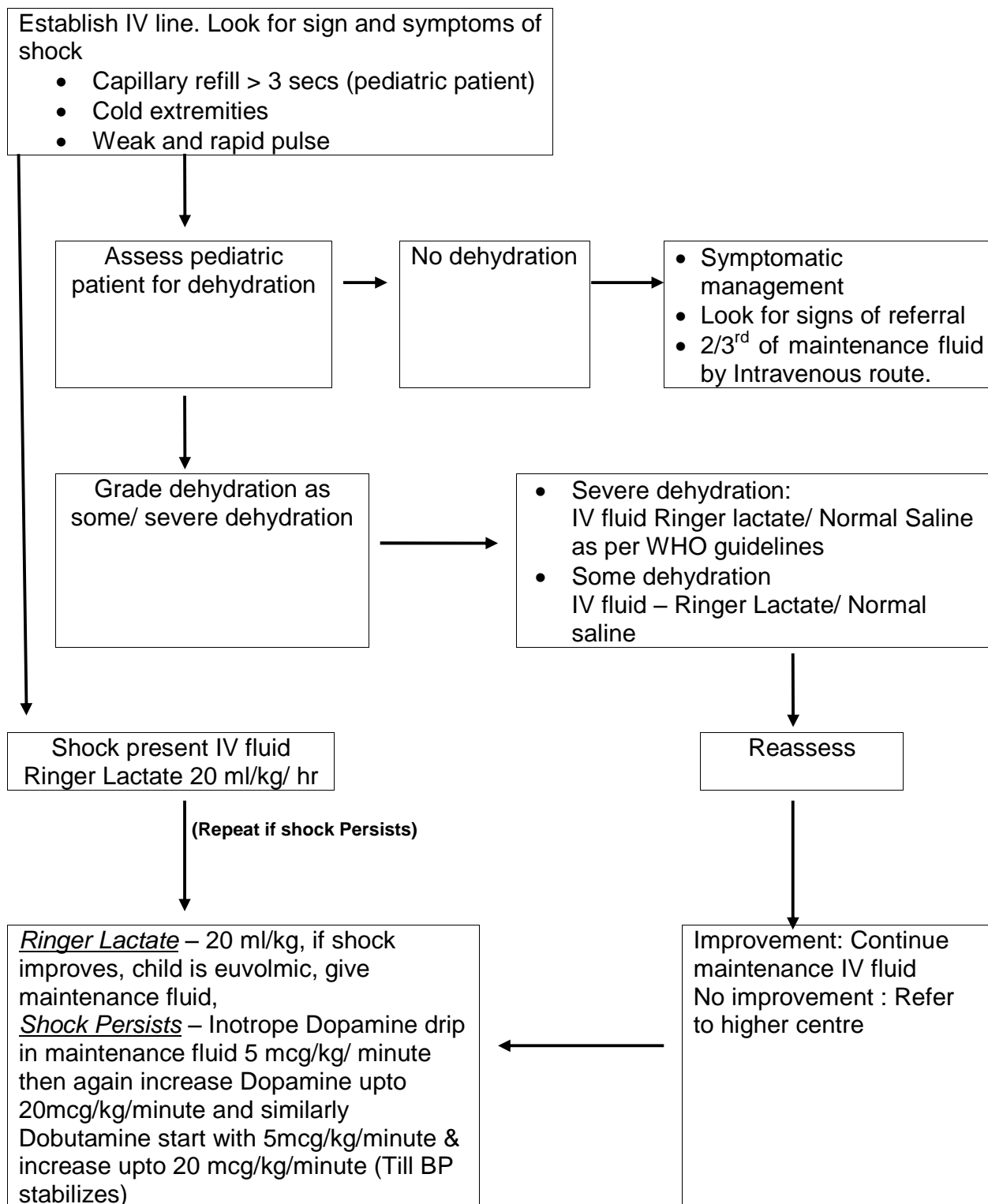


## **Indications of Ventilatory Support**

1. Deteriorating General Condition
2. Very Shallow Respiration/ Severe Respiratory Distress/ Heart Sound are Feeble
3. Capillary Refilling time/ colour of Patient Not Improved
4. Dusky Colour of body/ Cyanosis
5. Needs continuous Bag and Mask (Ambu) respiration
6. ABG Parameters

### 3.2.2

### MANAGEMENT OF CIRCULATION



**NB :** These are broad guidelines; ultimate decision regarding management will depend upon the attending physician.

### 3.2.3

### MANAGEMENT OF CONVULSIONS & I.C.T.

Give anti convulsants if there was a history of convulsions and not given earlier, or convulsions are present. Number one to three are first drug of choice, if convulsions are not controlled.

#### Anti Convulsants

Sl. No.	Name of Drugs	Closes	Available as	Route of Administration	Indication	Limitation/ Side Effects
1.	Phenobarbitone (Gardinal/Luminal)	20-40mg/kg As loading dose	200mg per ml. ampule	I/V Slowly after dilution in normal saline	Convulsion in infants can be used in all age groups	Good drug controlling seizure & long term use.
2.	Phenytoin (Eptoin/Dilantin)	15-20mg/kg	100mg/ 2ml amp.	I/V Slowly after dilution in normal saline	Convulsion in all age all groups	Good drug for control of seizure & as maintenance
3.	Sod. Valporate	20-40 mg/kg	I/V Oral Syrup	Syrup can be given as per rectal	All age group	-do-
4.	Diazepam	0.1-0.3mg/kg	I/V or P/R	<ul style="list-style-type: none"><li>I/V slowly</li><li>Syrup</li><li>Suppository</li><li>P/R</li></ul>	Uncontrolled Convulsions	May cause respiratory arrest in newborns & infants. Short acting
5.	Lorazepam	0.05-0.1mg/kg oral,	I/V	I/V Slowly	Uncontrolled Convulsion Safe in infants	Tachy cardea, depression Confusion blurred vision
6.	Midazolam	0.2mg/kg	1mg/5kg	S/C, intra nasal safe in injections	Uncontrolled convulsion in infants	Short acting
7.	Inj. Paraldehyde 11%	0.1-0.2mcg/kg deep gluteal can be replaced after ½-hrs.				

#### Maintenance Dose

- Phenobarbitone                      3-8mg/kg/day                      I/V or oral
- Phenytoin                              5-8 mg/kg/day                      I/V or oral
- Sodium Valproate                      40-60mg/kg/day                      Oral

#### MANAGEMENT OF INCREASED INTRACRANIAL PRESSURE(Tension) (Only after correction of Dehydration)

1. Mannitol 20% I/V – 5 ml/kg in ½ hrs as 1<sup>st</sup> dose than 2.5 ml/kg at 6 hrs. intervals upto 48 hours (8 doses).
2. Injection Lasix I/V – 1 mg /kg upto 40 mg can be given.
3. Glycerol solution:- Oral – 0.5 ml/kg mix with fruit juice can be given by nasogastric tube – 3 times a day
4. Steroids – are not indicated in viral encephalitis including JE.

### 3.2.4

### CONTROL OF TEMPERATURE

#### If No Rigors:-

- a) Tap Water Sponging: Not only on forehead, palms or soles, whole body to be wet with water and fan(ceiling/table/manual) is on. Cold sponging is harmful.
- b) If temperature is too high – Cold Sponges may be kept on head, axilla and groins.
- c) Injection Paracetamol: 5mg/kg, deep intra muscular at either lateral side of thigh or upper outer Quadrant of hip. If injection is not available give Paracetamol 10-15mg/kg maximum upto 600 mg by Nasogastric tube. Paracetamol Suppository are also available which may be used. Other antipyretic medicines e.g. nemusulide/ brufen/ meftal/ aspirin etc are not advisable, specially in children.

#### If chills or Rigors present :

- Don't cover patients
- Don't do water sponging
- Use Paracetamol injection, syrup, through nasogastric tube or Paracetamol suppository as advised above.



### 3.2.5 MANAGEMENT OF FLUID ELECTROLYTES AND CALORIES/NUTRITION

#### (A) Assessment of Dehydration and Management

##### 1. **Dehydration**

Dehydration is classified into No/ Some/ Severe Dehydration. Since it is difficult to assess dehydration in a patient of encephalitis as the patient is lethargic and unable to drink, therefore, skin turgor takes precedence over other signs. An objective way of classification would be as follows:

##### (i) **Some Dehydration:**

- Irritability
- Thirsty
- Sunken Eyes
- Less Tears
- Dry Mouth
- Skin Turgor Delay

##### (ii) **Severe Dehydration:**

- Floppiness
- Drowsiness/ Lethargy
- Unconscious
- Inability to Drink

##### (iii) **Signs of shock**

- Oliguria/ anuria
- Rapid and thready pulse
- Capillary filling time > 3secs
- Low Blood Pressure

#### **Management of Dehydration:**

##### (a) **Some Dehydration:**

- IV fluid Ringer lactate/ N saline 100m/kg to be given over 8 hrs.
- Where the facility for IV fluids is not available administer ORS 75m/kg in 4 hrs through nasogasrtic tube
- Reassess: if there is improvement continue with maintenance IV fluid/if no improvement is detected, switch to plan for severe dehydration

##### (b) **Severe Dehydration**

- IV fluid Ringer lactate 100ml/kg is given as per the table below Table 1:

<b>Rate of Fluid (Ringer Lactate)</b>	<b>30ml/kg</b>	<b>70ml/kg</b>
< 1yr	2 hrs	4 hrs
>1yr	1 hrs	5 hrs

- Reassess: If there is improvement switch to maintenance/ if no improvement is detected or deterioration is observed infuse IV fluid more rapidly.

## 2. **Maintenance**

Maintenance fluid is administered at the following rate Table 2:

<b>Weight</b>	<b>Fluid Volume</b>
1 – 10	10 ml / kg
11 – 20	1000 ml + 50cc/kg over & above 10 kg
21 – 40	1500 ml+20cc/kg over & above 10 kg

### **(B) Calories/ Nutrition**

During CNS infections and convulsion and hyperpyrexia state, calories specially glucose required is increased and it should be given in form of 10% Dextrose or even 25% Dextrose may be given on arrival of the patient. A total dose of 200 mg/kg may be given. All I/V fluids with Dextrose should be continued till patient is stabilized, convulsions are controlled, no vomiting and distention of abdomen, at this time, intra gastric feeding may added and slowly I/V fluids are replaced by total nasogastric feeding.

### 3.2.6

### GENERAL MANAGEMENT

1. **Suction :** Frequent suction either by mucous sucker, or suction machine to be done on an unconscious patient, so secretion may not collect in mouth to avoid aspiration and maintenance the patency of airways.

2. **Nasogastric Aspiration :** Nil orally, place a Nasogastric/ Ryles tube into stomach and do a frequent suction to avoid any vomiting and aspiration. It will also help in decompensation of stomach and decrease intra abdominal pressure. It will help in respiration.

3. **Care of Eye, Bowel Bladder & Back :**

- Eyes to be covered by wet gauge
- An antibiotic Eye ointment may be applied twice a day or liquid paraffin may be put in eyes to avoid drying of Cornea.
- If child does not pass stool, put a glycerine enema.
- Bed should be well maintained, don't allow to form any bed sore. Spirit & powder may be applied on back and on all pressure points.
- Frequent changing of patient's position.
- Catheterize the patient to avoid soiling of beds.
- Physiotherapy once patient is stabilized
- Other General Nursing Care
- Treat Secondary infections – by appropriate antibiotics
- Treat underlying other pathology – e .g. anemia, malnutrition, etc.

### 3.2.7

### TREATMENT OF SPECIFIC CAUSE IF ANY

1. **Herpes** - Acyclovir – 10 mg/kg/dose, slowly over a period of one hour – 8 hourly X 21 days.
2. **Zoster Varicella** - Acyclovir – 10mg/kg/dose, 1/2hrs slowly, over a period of 1 hour – 8 hourly X 2-3 weeks.
3. **Malaria** - I/V Quinine – 20 mg/kg in 5% Dextrose slowly over a period of 1hr then 10mg/kg 8 hourly. Monitor Blood Sugar and Blood Pressure.
4. **Meningitis (Pyogenic)** -  
Start with inj. Ampicillin 400 mg kg 6 hourly upto 12gm/day  
+  
Inj. Ceftriaxone 100-150mg/kg as stat dose than in two divided doses 12 hourly  
+  
Steroid  
Change antibiotics according to C/S report and response.
5. **TBM** - Anti Tubercular Drugs (1NH, PZA, Rcin + Ethambutol + Steroids)
6. **Toxoplasmosis** - Pyrimethamine 2mg/kg/24 hours in two divided doses X 2 days than 1mg/kg/ on alternate day.
7. **Amoebiasis** - Metronidazole – 10mg/kg I/V slowly 8 hourly X 10-14 days.
8. **Fungal Infection** - Inj. Amphotericin – B 5mg/kg/24 hours or Fluconazole – oral 200-400mg/kg for 3-6 months.
9. **Neurocysticercosis** - Albendazole oral 10/mg/kg(upto 400 mg)/day X 2 weeks.

### 3.2.8 INVESTIGATIONS, SAMPLE COLLECTION & TRANSPORTATION

#### A. Investigations

- i. Complete blood counts
- ii. Peripheral blood smear-Malarial parasite
- iii. Blood glucose, Electrolytes
- iv. CSF and Blood for serology by IgM ELISA/ virus isolation, CSF is preferred since by the time patient presents with CNS manifestations the level of viremia in blood has decreased and there is cross reaction with other flaviviruses.
- v. Other test if necessary – LFT/KFT/Blood Culture/X-ray/Ultrasound/CT/MRI/ECHO/ any specific test – Enzyme/ECG/EEG/Suspected Etiology

Virus isolation should be done only in Apex Reference Laboratories and only for selected cases by investigating team.

#### B. Specimen Collection

Blood(serum) and CSF specimen are to be collected. Blood specimen should be collected within 4 days after onset of illness for isolation of virus and at least 5 days after onset of illness for detection of IgM antibodies. A second convalescent sample should be collected 10-14 days after the first sample.

Following precautions need to be taken when samples are collected:

##### 1) **Blood/Serum**

- i) Equipment required
  - 5ml vacutainer tube(non-heparinized) with 23g needle/5ml syringe with needle
  - 5ml blood collection tube if syringe and needle are used for blood collection
  - Disposable gloves and face mask
  - Tourniquet
  - Sterilized swabs
  - Sterile serum storage vial
  - Specimen labels, marker pen
  - Band aid
  - Zip lock plastic bags
  - Lab request form
  - Cold box(vaccine carrier) with ice pack
  - First- aid kit
- ii) Collection procedure
  - Collect 5ml blood in a sterile tube labelled with patient identification and date of collection.
  - Keep at room temperature till clot retracts from serum.
  - Blood can be stored at 4-8° celsius for 24hrs before serum is separated, do not freeze whole blood.

- Transport whole clotted blood specimen to laboratory on ice if it can reach lab in 24 hrs/centrifuge at 1000rpm for 10mins to separate the serum or if centrifuge is not available carefully remove serum with a pipette and transfer serum to a sterile vial and store at 4-8° C.

### **C. Transportation**

- Specimen should be transported to laboratory as soon as possible, do not wait for collection of additional specimen.
- Put specimen in zip pouch/plastic bag with absorbent material(cotton/tissue)
- Use vaccine carrier/thermos flask for transport. In vaccine carrier use frozen packs along the sides and place specimen in the centre. Transport as in reverse cold chain.
- Place lab request form in a plastic bag and tape to inside of carrier
- Inform the lab about the time and manner of transportation
- Transport the serum on wet ice within 48hrs or it can be stored at 4-8° C for 7 days.
- If a delay is anticipated sera should be frozen at - 20° C and transported on frozen ice packs. Repeated freezing and thawing should be avoided as it affects the stability of IgM.

### **Lumbar Puncture & CSF Examination**

All attempts should be made to collect CSF specimens for confirmation of diagnosis.

#### **i) Collection**

- Lumbar puncture is the most commonly used means of collecting specimen
- Patient is positioned on his side with knees curled up to his abdomen, occasionally it is performed with the patient sitting or bent forward.
- Skin is scrubbed and local anesthetic is injected over lower spine. Spinal needle is inserted usually between L3 and L4 vertebrae.
- Once the needle is in supra-archnoid space pressure can be measured and fluid is collected. Usually 2-3 ml of fluid is collected in a sterile screw capped bottle.
- After sample is collected, the needle is removed and area is cleaned.
- Patient is advised to lie flat for 6-8 hrs.
- Perform physical examination of CSF, indicate the findings on the laboratory requisition form and transport to the laboratory as soon as possible. Store at 4 C if delay in processing is anticipated.

#### **ii) Storage and Transportation**

- Store at 4 C as soon as possible after collection and dispatch at the earliest on wet ice in vaccine carrier/thermo flask.
- Hands carry the specimen to laboratory preferably due to urgency.
- For PCR transport specimen on dry ice.
- A designated person should be responsible for storage, packing and transportation as per national guidelines.

### **3.2.9**

### **REHABILITATION**

- Physiotherapy/ PMR
- Advice of Pediatric Neurologist
- Correction to fix deformity – by Orthopaedic Surgeon
- Child Psychologist advice
- Various prosthesis
- Artificial appliances

### **3.2.10**

### **REPORTING OF A CASE**

It is very important to report all the suspected cases of AES or JE to the appropriate health authorities to prevent further spread of disease. It should be reported promptly in enclosed proforma (Annexure A & B). The details should be filled in clear and neat writing and all the information in the proforma should be provided.

ACUTE ENCEPHALITIC SYNDROME/ SUSPECTED JE CASE INVESTIGATION FORM								
EPID Number: AES- _____ - _____ - _____						AESF-4		
<b>Reporting Information</b>								
Date Case Reported: _____ / _____ / _____				Notified by : _____				
Date Case Investigated: _____ / _____ / _____				Investigated by: _____				
<b>Patient Information</b>								
Patient's Name: _____				Sex: _____				
Date of Birth : _____ / _____ / _____			Age: years _____ months _____					
Father's Name: _____				Religion: Muslim / Hindu / Other				
Address: _____				Landmark: _____				
Village / Mohalla: _____				Block / Urban Area: _____				
District : _____				State: _____		Setting: Urban/ Rural		
<b>Travel History over past Two Weeks from Onset of First Symptoms</b>								
Dates of visit	Date from :							
	Date to :							
Address								
Block								
District and State								
<b>Immunization History</b>								
JE immunization: Yes / No / Partial / Unknown				Date of last JE immunization: _____ / _____ / _____				
<b>Signs and Symptoms</b>								
Date of onset of first symptoms: _____ / _____ / _____				Headache: Yes / No / Unknown				
Change in mental Status: Yes / No / Unknown				Paralysis: Yes / No / Unknown				
Fever: Yes / No / Unknown				Unconsciousness: Yes / No / Unknown				
Seizure: Yes / No / Unknown				Neck rigidity: Yes / No / Unknown				
<b>Sample collection, tracking and results</b>								
	Date Collection	Date Sent	Date Result	Condition*	Laboratory Result (Circle)			
CSF					Positive	Negative	Not-tested	Unknown
Serum 1					Positive	Negative	Not-tested	Unknown
Serum 2					Positive	Negative	Not-tested	Unknown
<b>Diagnosis and final classification</b>								
Final Classification:		Laboratory confirmed JE / Probable JE / AES unknown / AES other agent						
Clinical Diagnosis: _____								
<b>Discharge Status</b>								
Status at discharge:		Alive / Dead / Unknown		Date of discharge: _____ / _____ / _____				
If alive, status of recovery:		Recovered completely / Recovered with disability						
If died, date of death: _____ / _____ / _____								
*Condition is adequate if specimen is transported in reverse cold chain						(Name & Signature) Designation		



## JAPANESE ENCEPHALITIS LABORATORY REQUEST AND REPORT FORM

AESF-5

		Patient Number:	Date: / /			
Patient name:						
Age:						
Name of parent of guardian:						
Province:		District:				
Town/Village:		Name of health facility:				
Number of doses of Japanese Encephalitis Vaccine:			Date of last dose: / /			
Date of onset of illness:						
Name & address of treating doctors:						
Clinical Features:						
SPECIMEN TYPE	SPECIMEN ID	DATE OF COLLECTION	DATE OF SHIPMENT			
(1)		/ /	/ /			
(2)		/ /	/ /			
(3)		/ /	/ /			
Name of person to whom laboratory results should be sent:						
Address:						
Telephone Number:		Fax Number:				
E-mail:						
<b>For use by the receiving laboratory:</b>						
Name of laboratory:						
Name of person receiving the specimen:						
Specimen condition*:						
SPECIMEN TYPE	DATE RECEIVED IN LAB	DATE RESULT	TEST TYPE	TEST RESULT	Date result to program/ sender	Remarks
	/ /	/ /			/ /	
	/ /	/ /			/ /	
	/ /	/ /			/ /	

- \* Sample is good if:**
- ? There is no leakage
- ? Of adequate quantity
- ? Brought in cold chain
- ? Documentation is complete

- If sample is bad specify**
- Add in the following information:
- Fever at onset: Y  N  Duration: \_\_\_\_\_
- Seizures: Y  N
- Altered level of consciousness: Y  N
- Neck rigidity: Y  N

**Any other information:** \_\_\_\_\_

Source : WHO Draft document operational guidelines

(Name & Signature)  
Designation

#### 4. CLINICAL DIFFERENTIATION OF JE FROM OTHER VIRAL/BACTERIAL/ PARASITIC INFECTIONS

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JE primarily involves the gray matter of many parts of the Central Nervous System. Differentiation of Encephalitis and Encephalopathy and making a probable etiological diagnosis of Japanese Encephalitis and Epidemic Brain Attack in rural areas, (where facilities are minimum but expectations are maximum), on clinical grounds is extremely important to manage the encephalitis case not only as an individual but also for the community since the management of JE and EBA call for immediate reporting to the Health Authorities for a wider coordinated intervention by many different departments to contain the epidemic. Epidemics of Viral Encephalitis demand a clinical diagnosis about the causative Virus for controlling the epidemic at the earliest and for asking for the specific test.

Simple clinical observations help in assessing the depth of coma, planning emergency measures necessary to save the child, limit disability, prognosticate and to initiate epidemic control measures. This must be followed by neurological examination for any localizing signs and to plan for the urgent investigations for a final diagnosis.

Exclusion of treatable conditions like Cerebral malaria, Epidemic Brain Attack, Meningoencephalitis, Herpes simplex virus encephalitis, Varicella / Zoster encephalitis, Metabolic causes of encephalopathy, Tuberculous Meningitis is extremely important since they require prompt additional specific treatment.

The therapy for JE / Epidemic Brain Attack is primarily conservative and supportive since there is no specific treatment for both Japanese Encephalitis and Epidemic Brain Attack, and both have a high case fatality rate, if prompt medical and nursing care is not provided.

Analysis of fatal cases of JE / Epidemic Brain Attack revealed that IGNORANCE is killing more children than the pathogen per se. Only 1 death out of every 35 deaths is directly due to JEV and all others are preventable with prompt and early management bringing down the USUALLY REPORTED case fatality rate of JE from 35-50% to less than 1%. Similar degree of lowering of morbidity is also possible. Same is the case with Epidemic Brain Attack also.

The prognosis of JE depends on the extent of involvement at primary presentation, timely management and autoimmune mechanisms of this disease.

##### 4.1 Japanese Encephalitis Case Definition:

Suspected case for referral to Hospital:-

- i. *Fever*
- ii. *Altered Sensorium*

##### Viral Encephalitis Syndromic Surveillance: *Suspected JE*

Primary Criteria:

- i. Epidemic season
- ii. Acute Fever
- iii. Altered Sensorium lasting > 6 hours
- iv. No rash<sup>1</sup>

- v. No evidence of any other encephalitis

#### Supportive Criteria

- i. Focal Neurologic S/S
- ii. Endemic areas
- iii. JE Season
- iv. CSF consistent with Viral Encephalitis
- v. Normal metabolic Profile

#### Probable JE

- Encephalitis syndrome
- CSF consistent with Viral Encephalitis
- Elevated IgM antibody
- Stable antibody

#### Confirmed Case:

- *Suspected case plus*
- *Any one or more of the following*
  - *JE IgM in CSF*
  - *Or 4 fold or greater rise of antibody titers in paired sera (acute / convalescent)*
  - *Or detection of virus, antigen or genome in tissue, blood or other body fluids.*

### 4.2 Management in Tertiary Level Hospitals

1. Hypoxia is alleviated by intubation, positive pressure ventilation, and ensuring an arterial Pao<sub>2</sub> of 65 mm Hg or better.
2. Hypotension is treated in a stepwise fashion by first volume infusion with isotonic fluids to normovolemia, next vasopressors and finally treatment is directed at reducing ICP in an effort to maintain CPP greater than 50.
3. Brainstem involvement may necessitate intubation & mechanical ventilation.
4. Cardiac arrest requires resuscitation measures.
5. SIADH (Syndrome of Inappropriate Anti Diuretic Hormone) is treated with Hypertonic saline.

### 4.3 Doctor's Responsibility during Epidemics

#### 1. Data Questionnaire filling

Data Questionnaire Form For Epidemic Encephalitides

Name:

Age:

Sex:

Full Address:

#### 2. Duration of S/S less than 4 days

Fever: Y / N

Loss of Consciousness / Abnormal behavior: Y/N

Abdominal Pain: Y/N

Diarrhea: Y/N

Rash: Y / N

Focal / Asymmetrical Symptoms/Signs: Y / N

**5. EQUIPMENTS AND DRUGS AT VARIOUS LEVELS**

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**5.1.1 Essential equipment at the PHC level:**

1. Air way Sizes “0” and “1”,
2. Mucus sucker,
3. Rubber feeding tube of various sizes
4. 5 ml & 2 ml Syringes with needles
5. Thermometer,
6. Adhesive tape
7. Enema set
8. Oxygen

**5.1.2 Essential Drugs at the PHC level:**

1. Syrup / Injection Paracetamol,
2. Diazepam rectal solution/ Syp. Diazepam/ Inj. Diazepam/Diazepam Suppository.
3. Suspension Valproate,
4. Glucose powder
5. Tab/Inj Frusemide
6. Inj Paraldehyde
7. I/V fluids

### **5.2.1 Essential equipment at the CHC level Hospital:**

- a. Air way Sizes "0" and "1",
- b. Mucus Sucker,
- c. Rubber feeding tube size 14,
- d. 5 ml Syringe,
- e. Thermometer,
- f. Adhesive tape,
- g. IV cannula, 22 to 24 ,
- h. Ambu Bag,
- i. Foley's Catheters of various sizes
- j. Lumbar Puncture sets
- k. Provision for Cerebrospinal fluid analysis.
- l. Enema set

### **5.2.2 Essential Drugs at the CHC level Hospital:**

1. Syrup Paracetamol,
2. Rectal solution or Syrup Diazepam,
3. Suspension Valproate,
4. Syrup Chloral hydrate,
5. Inj Diazepam,
6. Inj Phenytoin,
7. IV fluids N/2, N/5 with 5 % Dextrose, 10% Dextrose, Hypertonic saline,
8. Normal saline,
9. Inj Dexamethasone,
10. Inj Mannitol 20 %,
11. Inj Frusemide,
12. Oral Glycerol
13. Inj Dopamine
14. Inj Phenobarbitone.
15. Vitamins
16. Syrup / Tab Haloperidol
17. Syrup Chloral Hydrate
18. Inj Paraldehyde
19. Inj. Ampicillin
20. Inj. Chloramphenicol.
21. Inj Ceftriaxone.

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