Coma and convulsion

ETAT Module 4

Adapted from Emergency Triage Assessment and Treatment (ETAT): Manual for Participants, World Health Organization, 2005
Learning objectives

- Accurately assess consciousness using the AVPU coma scale.
- Recognize a child in coma.
- Recognize a child having a convulsion.
- Determine amount and type of fluid to treat low blood sugar.
- Demonstrate how to use a glucometer.
- Understand when to give anticonvulsants.
- Choose the appropriate anticonvulsant and dose to treat a child having a convulsion.
- Understand how to give medications rectally.
Target audience

• Healthcare providers in any facility who are likely to manage sick patients, including physicians, nurses, and assistants.
• Teachers and trainers for healthcare professionals
AVPU coma scale

- **A** Is the child Alert? (alert)
- **V** Is the child responding to Voice? (lethargic)
- **P** Is the child responding to Pain? (coma)
- **U** Is the child Unresponsive? (coma)
Altered mental status

courtesy of PAHO
Coma

- A
- V

- P  Is the child responding to Pain? (coma)
- U  Is the child Unresponsive? (coma)
Coma, convulsion: overview of assessment and management

C  Coma
Convulsion

Any positive signs
• AVPU score P or U
• Abnormal, uncontrolled movements

Manage
• Manage airway
• Position
• Give oxygen
• Glucose
• If convulsing, give rectal diazepam
Convulsions

- Unconscious
- Abnormal, uncontrolled movements, particularly of extremities and eyes
  - Stiffening
  - Jerking
  - Eye deviation
  - Facial twitching
- Loss of bladder control

Signs of convulsions for infants

- Unconscious
- May not have jerking movements of extremities
- Repetitive movements such as lip-smacking or facial twitching
Manage airway

• Is the airway obstructed?
  – Position the airway.
  – Do **NOT** put anything in the mouth of a child who is having a convulsion.

• Give oxygen.
Recovery position

- Turn child on side.
- Slightly extend neck.
- Place the cheek on one hand to stabilize head.
- Bend one leg to stabilize body position.
Child is having a convulsion that has lasted longer than 10 minutes

- Manage airway
- Give oxygen
- Measure/give glucose

> 2 weeks of age

- Give lorazepam (0.1 mg/kg IV) or diazepam (0.5 mg/kg, rectally)

After 10 minutes, convulsion persists

- Give lorazepam (0.1 mg/kg IV) or diazepam (0.5 mg/kg, rectally)

After 10 minutes, convulsion persists

- Give lorazepam (0.1 mg/kg IV)
- Or diazepam (0.5 mg/kg, rectally)
- Or phenytoin, 20 mg/kg, IV
- Or phenobarbital, 20 mg/kg, IM or IV

≤ 2 weeks of age

- Give phenobarbital: 20 mg/kg, IM or IV*

After 10 minutes, convulsion persists

- Give phenobarbital: 10 mg/kg, IM or IV

*If phenobarbital is not available, use lorzepam, diazepam and phenytoin as per left side of algorithm.
Treat low blood sugar

- Hypoglycemia
  - Well-nourished: <2.5 mmol/L (45 mg/dL)
  - Severely malnourished: <3 mmol/L (55 mg/dL)

- If you cannot check blood sugar, assume that it is low and treat.
Demonstration

Glucometer Use
Hypoglycemia: Amount of glucose (ml) to give as bolus by age or weight

<table>
<thead>
<tr>
<th>Age/weight</th>
<th>10% glucose (5 mL/kg)</th>
<th>50% glucose (plus sterile water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 months (&lt;4 kg)</td>
<td>15 mL</td>
<td>3 mL plus 12 mL water</td>
</tr>
<tr>
<td>2- &lt;4 months (4- &lt;6 kg)</td>
<td>25 mL</td>
<td>5 mL plus 20 mL water</td>
</tr>
<tr>
<td>4- &lt;12 months (6- &lt;10 kg)</td>
<td>40 mL</td>
<td>8 mL plus 32 mL water</td>
</tr>
<tr>
<td>1- &lt;3 years (10- &lt;14 kg)</td>
<td>60 mL</td>
<td>12 mL plus 48 mL water</td>
</tr>
<tr>
<td>3- &lt;5 years (14- &lt;19 kg)</td>
<td>80 mL</td>
<td>16 mL plus 64 mL water</td>
</tr>
</tbody>
</table>

Adapted from ETAT manual for participants, Table 6 page 38
How to give glucose

• Give 5 mL/kg of 10% glucose.
• Recheck blood glucose in 30 minutes.
• Repeat 5 mL/kg of 10% glucose if it is still low.
• Without IV access, give milk or sugar solution (4 teaspoons of sugar in 200 mL of clean water) via NG tube.
• Feed child as soon as she is conscious.
Anticonvulsants

- **Lorazepam**
  - First line anticonvulsant
  - Works quickly.
  - Given IV

- **Diazepam**
  - Second line anticonvulsant (if Lorazepam not available)
  - Works quickly (within 2 to 4 minutes when given rectally).
  - Can be given rectally.

- **Phenytoin**
  - Must be given IV.

- **Phenobarbital**
  - Use as an alternative to diazepam.
  - Use as first choice for infants <2 weeks of age.
  - Can be given IM.
<table>
<thead>
<tr>
<th>Age/weight</th>
<th>Lorazepam (IV) 0.1 mg/kg</th>
<th>Diazepam (rectal) 0.5 mg/kg (0.1 mL/kg, 10 mg/2 mL)</th>
<th>Phenytoin (IV) 20 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 weeks to 2 months (&lt;4 kg)</td>
<td>0.3 mg</td>
<td>1.5 mg (0.3 mL)</td>
<td>60 mg</td>
</tr>
<tr>
<td>2- &lt;4 months (4- &lt;6 kg)</td>
<td>0.5 mg</td>
<td>2.5 mg (0.5 mL)</td>
<td>100 mg</td>
</tr>
<tr>
<td>4- &lt;12 months (6- &lt;10 kg)</td>
<td>1 mg</td>
<td>5.0 mg (1.0 mL)</td>
<td>200 mg</td>
</tr>
<tr>
<td>1- &lt;3 years (10- &lt;14 kg)</td>
<td>1.2 mg</td>
<td>6.25 mg (1.25 mL)</td>
<td>250 mg</td>
</tr>
<tr>
<td>3- &lt;5 years (14- &lt;19 kg)</td>
<td>1.5 mg</td>
<td>7.5 mg (1.5 mL)</td>
<td>300 mg</td>
</tr>
</tbody>
</table>
Phenobarbital: dose for infants <2 weeks of age

<table>
<thead>
<tr>
<th></th>
<th>2 kg or less</th>
<th>3 kg or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial dose of phenobarbital (200 mg/mL) 20 mg/kg</td>
<td>0.2 mL</td>
<td>0.3 mL</td>
</tr>
<tr>
<td>Second dose (if convulsion continues) (10 mg/kg)</td>
<td>0.1 mL</td>
<td>0.15 ml</td>
</tr>
</tbody>
</table>

Adapted from ETAT manual for participants, Table 8 page 40
How to give rectal medications

- Draw appropriate dose of medication into a tuberculin syringe.
- Remove the needle.
- Insert the syringe into the child’s rectum (about 3 to 5 cm, depending on the child’s size).
- Inject the medication and remove the syringe.
- Hold the child’s buttocks together for 2 to 3 minutes.
When management resources are limited

- Use guidelines from Integrated Management of Childhood Illness (IMCI).
- IMCI chartbook uses the same assessment and classification principles as ETAT.
- Management recommendations emphasize recognizing patients that should be stabilized and transferred.
Summary

Coma
• Manage airway
• Check blood sugar
• Position child

Convulsing
• Manage airway
• Check blood sugar
• Give lorazepam IV or diazepam rectally
• Position child
Coma, convulsion: IMCI all ages

**Coma**

**Convulsion**

**C**

Any positive signs

- AVPU score P or U
- Abnormal, uncontrolled movements

**Manage**

- Position
- Keep warm
- Give glucose
- Consider antibiotics
- Refer urgently to hospital