

# Thiamine deficiency disorders: identification and treatment

## Different clinical presentations of thiamine deficiency:

Acute Cardiologic Form	Aphonic Form	Pseudo Meningitic Form	Encephalopathy	Peripheral Neuropathies
<ul style="list-style-type: none"> <li>• Peak prevalence in breastfed babies of 1–3 months of age</li> <li>• Colic</li> <li>• Restlessness</li> <li>• Anorexia</li> <li>• Vomiting</li> <li>• Edema</li> <li>• Cyanosis and breathlessness with signs of heart failure leading to death</li> <li>• Pernicious form or Shoshin Beriberi</li> <li>• Sudden cardiogenic shock</li> </ul>	<ul style="list-style-type: none"> <li>• Peak prevalence in 4- to 6-month-old infants</li> <li>• Initially hoarse cry until no sound is produced while crying</li> <li>• Restlessness</li> <li>• Edema</li> <li>• Breathlessness and death</li> </ul>	<ul style="list-style-type: none"> <li>• Peak prevalence in 7- to 9-month-old infants</li> <li>• Nystagmus (involuntary eye movement)</li> <li>• Muscle twitching</li> <li>• Bulging fontanelle</li> <li>• Convulsions</li> <li>• Unconsciousness</li> </ul>	<ul style="list-style-type: none"> <li>• Generally older children or adults but also seen in infants</li> <li>• Psychomotor slowing or apathy</li> <li>• Nystagmus or ophthalmoplegia</li> <li>• Ataxia</li> <li>• Impaired consciousness</li> <li>• Eventually coma and death</li> </ul>	<ul style="list-style-type: none"> <li>• Older children or adults</li> <li>• Pain</li> <li>• Tingling or loss of sensation in hands and feet (peripheral neuropathy)</li> <li>• Muscle wasting with loss of function or paralysis of the lower extremities</li> <li>• Loss of ankle and knee reflexes</li> <li>• Cranial nerve impairment</li> </ul>

## When should treatment with thiamine be considered:

Case definitions: At least 3 major manifestations OR At least 2 major + 2 minor manifestations AND response to thiamine within 24 hours (very likely TDD) OR within 72 hours (probable TDD)		
	Major Manifestations	Minor Manifestations
Infant	<ul style="list-style-type: none"> <li>• Sudden heart failure between 1-6 months</li> <li>• Incessant cry, hoarseness, followed by loss of voice</li> <li>• Cyanosis and difficulty breathing</li> <li>• Significant liver enlargement</li> <li>• Bulging fontanelle</li> <li>• Nystagmus</li> <li>• Muscle twitching</li> <li>• Loss of consciousness</li> <li>• Fits (without fever)</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced suckling or refusing to feed for at least 48 hours</li> <li>• Repetitive vomiting</li> <li>• Constipation</li> <li>• Tachycardia with warm extremities without fever (early sign)</li> </ul>
Child or Adult	<ul style="list-style-type: none"> <li>• Difficulty walking (ataxia)</li> <li>• Abnormal eye movements</li> <li>• Confusion, behavior change</li> <li>• Impaired consciousness, coma</li> </ul>	<ul style="list-style-type: none"> <li>• Bilateral tingling and numbness in limbs</li> <li>• Lethargy, apathy</li> <li>• Tachycardia with warm extremities</li> <li>• Signs of B-vitamins deficiency (e.g. angular stomatitis)</li> </ul>

## Treatment options:

1) Mild deficiency states (including lactating women at risk of inadequate thiamine intakes):

First week: 10 mg of thiamine/day, oral dose

Following 6 weeks: 3–5 mg of thiamine/day, oral dose

2) Severe deficiency states:

### • Infants

Immediately: if severe heart failure, convulsions or coma occur, 25–50 mg of thiamine, very slowly, intravenously

Following week: 10 mg of thiamine/day, intramuscular dose

Following 6 weeks: 3–5 mg of thiamine /day, oral dose

### • Children and adults

Immediately: 50–100 mg of thiamine, very slowly intravenously

Following 6 weeks: 3–5 mg of thiamine/day, oral dose

### References:

Prinzo ZW. *Thiamine Deficiency and Its Prevention and Control in Major Emergencies*.; 1999.

[http://www.who.int/nutrition/publications/emergencies/WHO\\_NHD\\_99.13/en/](http://www.who.int/nutrition/publications/emergencies/WHO_NHD_99.13/en/).

Whitfield K, Bourassa MW, Adamolekun B, et al. Thiamine deficiency disorders: diagnosis, prevalence, and a roadmap for global control programs. *Ann New York Acad Sci*. 2018;xxx(xxx):xxx.