

Critical Illness Polyneuropathy

Critical Illness Myopathy

Spectrum of Neuromuscular Problems in the Critically Ill

- **Peripheral neuropathy**
 - Critical illness polyneuropathy
 - Acute motor neuropathy
- **Neuromuscular junction dysfunction**
 - Transient neuromuscular blockade (pharmacologic)
- **Myopathy**
 - Disuse / Type II muscle fiber atrophy
 - Thick-filament myopathy
 - Necrotizing myopathy

Critical illness polyneuropathy

Synonyms:

- **Neuropathy of critical illness**
- **Intensive care (ICU) neuropathy**
- **Intensive care polyneuropathy**

Critical illness polyneuropathy

Criteria for CIP diagnosis:

- **Presence of sepsis, multi-organ failure, respiratory failure, or septic inflammatory response syndrome (SIRS).**
- **Difficulty weaning from ventilator or limb weakness**
- **Decreased amplitudes of compound muscle and sensory action potentials**
- **Widespread denervation potentials in muscle**
- **Normal or mildly increased levels of blood CPK**

Critical illness polyneuropathy

Differential diagnosis:

- Spinal cord dysfunction
- Critical illness myopathy
- Guillain-Barre syndrome
- Motor neuron disease
- Porphyria
- Pre-existing neuropathy
- Myasthenia

Critical illness polyneuropathy

Other tidbits:

- Recovery is weeks to months (i.e., faster than Guillain-Barre)
- No medication therapy, only conservative management
- Occurs in up to 70% of septic patients, but not all are significantly symptomatic.
- Neuropathy is primarily distal
- 50% have complete recovery

Critical illness myopathy

Synonyms:

- Myopathy of critical illness
- ICU (intensive care) myopathy
- Acute quadriplegic myopathy
- Acute necrotizing myopathy

Critical illness myopathy

Features:

- **Low or normal compound muscle action potentials on EMG**
- **Sensory nerve action potentials normal (unless abnormal from pre-existing neuropathy)**
- **Muscles unexcitable from direct stimulation**

Critical illness myopathy

Features:

- **Muscle biopsy may be abnormal, varying from Type II fiber atrophy to necrosis .**
- **Possible contribution from neuromuscular blockers, steroids, sepsis, or prolonged immobility.**
- **Severe necrotizing neuropathy may never recover.**

CIP/CIM Testing

May include:

- **MRI C-spine**
- **EMG/NCS**
- **Repetitive stimulation**
- **Phrenic nerve studies**
- **Creatinine phosphokinase and/or aldolase**
- **Muscle biopsy**

Systemic Inflammatory Response Syndrome

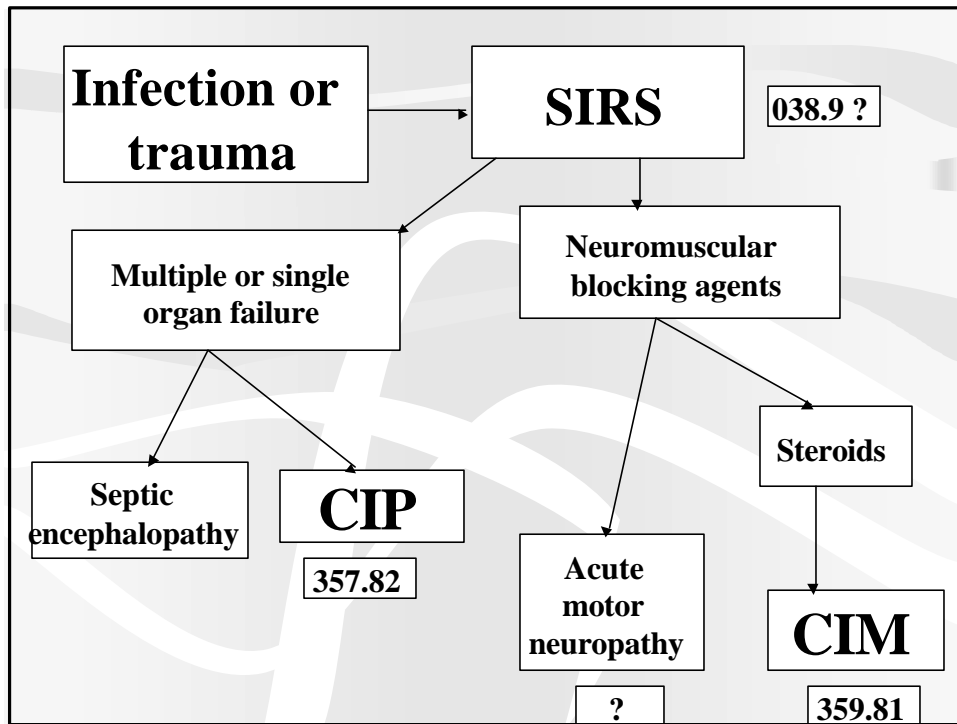
Postulates:

- **Altered microcirculation**
- **Pro-inflammatory cytokines released causing increased microvascular permeability**
- **Axonal degeneration due to glucose-induced phosphate depletion**
- **Damage from parenteral lipids**
- **Impaired transport of axonal proteins**
- **Endoneural edema and/or hypoxia**

Systemic Inflammatory Response Syndrome

Only direct markers:

- **Increased duration of ICU stay**
- **Increased serum glucose**
- **Decreased serum albumin**



TABULAR MODIFICATIONS

357	Inflammatory and toxic neuropathy
	357.8 Other
	Chronic inflammatory demyelinating polyneuritis
New code	357.81 Chronic inflammatory demyelinating Polyneuritis
New code	357.82 Critical illness polyneuropathy
New code	357.89 Other inflammatory and toxic neuropathy
359	Muscular dystrophies and other myopathies
	359.8 Other myopathies
New code	359.81 Critical illness myopathy
	359.89 Other myopathies

INDEX MODIFICATION

Syndrome
Add

Systemic inflammatory response (038.9)