

### **Psychiatric Disturbances:**

#### **Social Deficits, Social withdrawal**

Mercury

#### **Repetitive, perseverative, stereotyped behaviors; OCD-typical behaviors**

Mercury

#### **Depression, mood swings, flat affect; impaired facial recognition**

Arsenic, Copper, Lead, Mercury

#### **Schizoid tendencies; hallucinations; delirium**

Mercury

#### **Irritability, aggressive behaviors, temper tantrums**

Lead, Mercury

#### **Suicidal Behaviors**

Copper, Mercury

#### **Sleep difficulties/ disturbances**

Lead, Mercury, Thallium

#### **Chronic fatigue (CFS); weakness, malaise**

Aluminum, Arsenic, Cadmium, Copper, Lead, Mercury, Thallium

#### **Anorexia; symptoms reflecting eating disorders, loss of appetite/weight**

Arsenic, Lead, Mercury

#### **Anxiety; nervous tendencies**

Thallium

#### **Attentional problems (ADHD), lacks eye contact, impaired visual fixation**

Lead, Mercury

### **Speech and Language Deficits:**

#### **Speech disorders**

Aluminum, Mercury

#### **Loss of speech, developmental problems with language**

Mercury

#### **Speech comprehension deficits**

Mercury

#### **Dysarthria; articulation problems; slurred speech, unintelligible speech**

Mercury

### Cognitive Impairments:

**Mental retardation, borderline intelligence**

Arsenic, Lead, Mercury

**Uneven performance on IQ scores, low IQ scores**

Copper, Lead

**Poor concentration, attention deficits (ADHD), response inhibition**

Aluminum, Lead

**Poor memory (short term, verbal, and auditory)**

Aluminum, Lead

**Difficulties understanding abstract ideas; difficulty carrying out complex commands**

X Metals

**Dementia; pre-senile and senile dementia**

Aluminum

**Stupor**

Aluminum, Arsenic

**Impaired reaction time; lower performance on timed tests**

*Lead*

### Sensory Abnormalities:

**Abnormal Sensations in the mouth and extremities**

*Arsenic*

**Hearing loss, difficulty hearing**

Arsenic, Lead, Mercury

**Abnormal touch sensations; diminished touch sensations, aversion to touch**

Arsenic

**Blurred vision; sensitivity to light**

Arsenic, Mercury

### Motor Disorders:

**Choreiform movements, myoclonal jerks, unusual postures**

Copper, Mercury

**Difficulty walking, swallowing, talking**

Copper, Mercury

**Flapping, circling, rocking, toe walking**

Mercury

**Problems with intentional movements or imitation**

Mercury

**Abnormal gait/posture; incoordination, loss of balance; problems sitting, lying, crawling, and walking**

Mercury

**Decreased locomotor activity**

Aluminum, Arsenic

**Convulsions; seizure**

Aluminum, Arsenic, Copper, Lead, Mercury, Thallium

### Physiological Impairment

#### Brain and Central Nervous System:

**Neurofibrillary tangles**

Aluminum

**Neuritis, retrobulbar neuritis; neuropathy**

Aluminum, Arsenic, Thallium

**Encephalopathy**

Aluminum, Arsenic, Lead, Thallium

**Cerebrovascular disease**

X Metals

**Alterations in nerve conduction velocity**

Lead

**Alterations in the spinal chord**

Thallium

**Accumulates in CNS structures**

**Aluminum, Mercury**

**Abnormal EEGs**

Arsenic, Lead

**Autonomic disturbances**

Copper, Lead, Mercury, Thallium

#### Peripheral Nervous System:

**Peripheral neuropathy**

Arsenic, Mercury

**Alterations in peripheral nerves**

Arsenic

**Loss of feeling/ numbness in the extremities; paresthesia**

Arsenic, Mercury, Thallium

### **Gastrointestinal Tract:**

**Nausea, vomiting, diarrhea; loss of appetite**

Arsenic, Copper, Mercury, Thallium

**Abdominal pain, stomach cramps; burning of the throat and mouth**

Arsenic, Copper, Lead, Mercury, Thallium

**Esophagitis; gastroenteritis; colitis**

Arsenic, Mercury, Thallium

**Cancers (colon, pancreatic, stomach, or rectal)**

Arsenic

### **Renal and Hepatic Impairment:**

**Hepatotoxicity; Liver dysfunction, damage**

Arsenic, Copper, Thallium

**Cirrhosis of the liver; hepatitis**

Copper

**Kidney disease ; kidney failure**

Arsenic, Lead, Mercury

**Renal toxicity; tubular proteinosis**

Arsenic, Copper, Lead

**Kidney Damage, histological alterations**

Arsenic, Lead

### **Cardiovascular System:**

**Blood vessel damage**

Arsenic

**Anemia; decreased red blood cell count**

Arsenic, Copper, Lead

**Hypertension; increased heart rate (tachycardia)**

Arsenic, Copper, Lead, Thallium

**Electrocardiac disorders**

**Peripheral vascular disease; cardiovascular disease; vascular collapse**

Arsenic, Lead

### **Respiratory System:**

**Pulmonary Fibrosis**

Aluminum, Arsenic

**Pulmonary edema**

X Metals

**Pneumonia, laryngitis, pharyngitis, bronchitis**

Aluminum, Arsenic, Mercury

**Restrictive airway disorders, asthmatic conditions, pneumoconiosis**

Arsenic, Aluminum

**Respiratory tract cancers**

Arsenic

**Nasal ulcers, perforation of the nasal septum**

X Metals

### Immune System

**Increased incidences of asthma, autoimmune-like symptoms, allergies & inhibition of lymphocytes, T-cells, monocytes**

X metals

**Immunosuppression**

Lead

**Decreased white blood cell count**

Arsenic, Thallium

### **Reproductive System:**

**Genital abnormalities**

Aluminum, Thallium

**Disturbances in menstrual cycle; menstrual pains**

Copper, Mercury

**Birth defects; premature births; Spontaneous abortion**

Arsenic, Lead, Mercury

**Reproductive dysfunction**

Arsenic, Aluminum, Cadmium, Lead

### **Other Physical Disturbances:**

**Hypotonia or hypertonia; decreased muscular strength**

X Metals

**Rashes, contact dermatitis, eczema, itchy/irritating skin**

Aluminum, Arsenic, Copper, Mercury

**Muscle pain; headache; acrodynia; colic**

Arsenic, Copper, Lead, Thallium

**Alopecia (hair loss)**

Thallium