AACN PCCN Webinar

Session 4

Neurology & Behavioral

Presenter: Carol A. Rauen, RN, MS, CCNS, CCRN, PCCN, CEN
Independent Clinical Nurse Specialist & Education Consultant
rauen.carol104@gmail.com
### Table of Contents

Neurology ................................................................................................................................. 2

Behavioral ............................................................................................................................... 13
Neurology

I. INTRODUCTION

PCCN Test Plan

Neurology, Multisystem, Behavioral: 15%

a. Cerebrovascular Malformation (including aneurysm, AV malformation)
b. Encephalopathy (e.g., hypoxic-ischemic, metabolic, edema, infectious, hepatic)
c. Intracranial Hemorrhage (e.g., subarachnoid, epidural, encephalitis)
d. Seizure Disorders
e. Stroke (cerebrovascular accident)
   • Ischemic (embolic)
   • Hemorrhagic
   • Transient Ischemic Attack (TIA)

II. ANATOMY & PHYSIOLOGY

a. Skull
b. Brain
c. Meninges: Dur Mater, Arachnoid, Pia Mater
d. Cerebrum
e. Brain Stem
f. Cerebellum
g. Cranial Nerves
h. Blood Vessels
i. Cerebral Spinal Fluid
j. Spinal Cord
k. Peripheral Nerves

III. NEURO ASSESSMENT (Included for Review)

a. Level of Consciousness (LOC)
b. Glasgow Coma Scale (GCS) 3-15
   • Eye Opening - 1- 4 points
   • Best Verbal Response – 1- 5 points
   • Best Motor Response – 1- 6 points
c. Pupils
   - Size: Sympathetic & Parasympathetic, CN II & III
   - Shape
   - Symmetry
   - Reaction to Light
   - Extra Ocular Movement: CNIII, IV
   - Abnormal Pupillary Findings
     o Nonreactive, midposition: Midbrain Damage
     o Nonreactive Pinpoint: Pons Damage
     o Reactive, Small & Equal: Damage Affecting Sympathetic Innervation
     o One Fixed & Dilated Pupil: Same side CN III compression or injury
     o Bilateral Fixed & Dilated Pupils: Severe Brain Compression, Ischemia and/or Anoxia

d. General Observation
   - Behavior
   - Mood/Affect
   - Appearance
   - Communication Pattern and Style
   - Organized Flow of Thoughts

e. Motor & Sensory

f. Cognitive Function
   - Orientation
   - Memory & Retention
   - Attention
   - Abstract Reasoning
   - Judgment

g. Language & Communication
   - Aphasia
     o Expressive Aphasia (Brocca’s) – Dominant Frontal Lobe
     o Receptive Aphasia (Wernicke’s) – Dominant Temporal Lobe

h. Respiratory Patterns
   - Cheyne-Strokes Breathing: Problem in Cerebral Hemispheres, Diencephalon or Basal Ganglia
   - Neurogenic Hyperventilation: Midbrain or Upper Pons Problems
   - Apneustic Breathing: Pons Lesion (prolonged inspiration with pauses)
### Cranial Nerves

<table>
<thead>
<tr>
<th>#</th>
<th>Cranial Nerve</th>
<th>function</th>
<th>assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Olfactory</td>
<td>• Smell</td>
<td>• Evaluate Ability to Identify Odors</td>
</tr>
<tr>
<td>II</td>
<td>Optic</td>
<td>• Vision</td>
<td>• Evaluate Sight</td>
</tr>
<tr>
<td>III</td>
<td>Occulomotor</td>
<td>• Eye Movement</td>
<td>• Evaluate Eye Movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pupil Constriction</td>
<td>• Towards Nose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Elevation of Eye Lid</td>
<td>• Up and In, Down and In</td>
</tr>
<tr>
<td>IV</td>
<td>Trochlear</td>
<td>• Eye Movement</td>
<td>• Evaluate Eye Movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Downward and Inward</td>
</tr>
<tr>
<td>V</td>
<td>Trigeminal</td>
<td>• Sensation to Face</td>
<td>• Tighten Jaw (Clench Teeth)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Muscles of Mastication</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Corneal Reflex</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>Abducens</td>
<td>• Eye Movement</td>
<td>• Evaluate Eye Movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Laterally Outward</td>
</tr>
<tr>
<td>VII</td>
<td>Facial</td>
<td>• Muscles of Face</td>
<td>• Demonstrate Facial Expressions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Taste Anterior Tongue</td>
<td>• Show Teeth</td>
</tr>
<tr>
<td>VIII</td>
<td>Acoustic</td>
<td>• Vestibular – Balance</td>
<td>• Evaluate Hearing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cochlear – Hearing</td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td>Glossopharyngeal</td>
<td>• Pharyngeal Reflex (gag)</td>
<td>• Swallow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Taste Posterior Tongue</td>
<td>• Evaluate Gag</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Swallowing</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Vagus</td>
<td>• Parasympathetic Innervation</td>
<td>• Assessed with Glossopharyngeal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Swallowing</td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>Spinal Accessory</td>
<td>• Sternocleidomastoid &amp; Trapezius Muscle Movement</td>
<td>• Shrug Shoulders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Rotate Head</td>
</tr>
<tr>
<td>XII</td>
<td>Hypoglossal</td>
<td>• Movement of Tongue</td>
<td>• Check Speech</td>
</tr>
</tbody>
</table>

### IV. STROKE: TIME IS BRAIN

**Definitions**

a. **Stroke**: Permanently impaired central nervous system (CNS) tissue/functioning due to impaired cerebrovascular perfusion

b. **Transient Ischemic Attack (TIA)**: Lasts for minutes to hours. No detectable dysfunction or tissue damage

c. **Penumbra**: Viable but not functioning neuronal cells. This area may recover and not progress to stroke
Risk Factors

a. Age
b. Hypertension
c. Atrial Fibrillation
d. Dyslipidemia
e. Diabetes Mellitus
f. Coronary Artery Disease
g. Sedentary Lifestyle
h. Smoking
i. Obesity
j. Valvular Disease

Causes of Ischemic Stroke

a. Thrombotic
   • Atherosclerosis
   • Vasculitis
   • Arterial Dissection
   • Hematologic Disorders
b. Embolic
   • Cardiogenic
   • Athero-thrombotic Arterial Source
   • Unknown Source: Hypercoagulable State

Initial Assessment

a. Goals
   • Rapid Assessment
   • Initiate Treatment
b. Assessment
   • ABC’s
   • Vital Signs
   • Cardiac Monitor
   • Accurate Event History
   • Presentation (language, motor, sensory)
c. Common Stroke Signs: Sudden
   • Rarely Loss Consciousness
   • Asymmetrical Facial Expression
   • Weakness on One Side of the Body
   • Numbness on One Side of the Body
   • Difficulty Speaking or Understanding
• Difficulty Walking
• Visual Difficulty: Homonymous Hemianopia, visual field cut same side as stroke
• Severe, Unexplained Headache
d. Tests
  • CT Scan (no contrast)
  • MRI
  • Transcranial Doppler
  • Blood Work

Ischemic Stroke Care

a. Hypertension
  • Normal Response to Stroke
  • Usually Resolves in 3-4 days
  • Some HTN is Good
  • Only tx if SBP >220, DBP > 140 or MAP >130
  • Unless t-PA: SBP > 185, DBP > 110
b. Do Not Lower Blood Pressure > 10 % per hour
c. Activase (alteplase or rt-PA)
  • Only FDA Approved Drug Therapy
  • Within 3 Hrs of Onset and 4.5 Hrs for some patients
  • Dose 0.9 mg/kg
  • 10% Bolus Over 1Minute
  • Remainder of Dose Over 1 Hour
  • No ASA, Heparin, etc x 24 Hours
d. Interventions
  • Treat Hypotension
  • Treat Hyperthermia (Keep < 37.5° C)
  • Maintain Serum Glucose 80 - 150
  • Monitor ABG’s and Pulse Ox
  • Protect Airway
  • Initially Flat Until Hemodynamically Stable  \(\rightarrow\) HOB > 45°
  • NPO  \(\rightarrow\) Swallowing Study

Hemorrhagic Stroke (Intracerebral Hemorrhage)

a. Bleeding into Tissue/Parenchyma
b. Commonly From Hypertension
c. Signs & Symptoms
  • Severe Headache, N/V, Loss of Consciousness
  • Retinal Hemorrhage
  • Similar to Ischemic Strokes
  • Localized Blood Seen on CT
d. Bleeding into the Subarachnoid Area  
e. Often Due to a Ruptured Aneurysm or AVM  
f. Often Due to Trauma  
   • Epidural – Arterial  
   • Subdural – Venous: Acute, Subacute, Chronic  
   • Intercranial  
   • Subarachnoid  
   • Hematomas

**Aneurysm**  
a. Types  
   • Fusiform  
   • Berry  
   • Saccular  
b. Rupture  
   • Bleeds into the Subarachnoid Space  
   • Bleeding Continues Until Tamponade Occurs and Thrombus Forms

**Arteriovenous Malformation (AVM)**  
A congenital abnormal linkage between an artery and vein. When ruptured or leaking will present the same as an intracerebral hemorrhage.

**Assessment**  
a. “Worst Headache of My Life”  
b. N/V  
c. Loss of Consciousness  
d. Nucal Rigidity and Photophobia  
e. Focal Deficits  
f. Clinical Findings Similar to Ischemic Strokes  
g. Ventricular and/or Subarachnoid Blood Seen on CT  
h. CSF from LP Positive for Blood  
i. Hydrocephalus Might Occur  
j. Hyponatremia Might Occur  
   • SIADH  
   • DI

**Medical Management**  
a. Diagnostic Work up  
   • CT/MRI  
   • Cerebral Angiogram  
   • MRA  
   • Transcranial Doppler  
   • Lumbar Puncture  
   • Laboratory Assessment
b. Strict Control of Blood Pressure
   c. Pre-Repair -- MAP 80-90, BPS < 140
      • Sodium Nitroprusside (Nipride)
      • Normodyne (Labetalol)
      • Hydralazine (Apresoline)
      • Aneurysm Precautions
      • Pain Relief
   d. Post-Repair: Vasospasm – Major Concern
      • Triple H Therapy (trending out of favor 2012)
         o Hypertensive -- MAP 120-150
            ▪ Phenylephrine (Neosynephrine)
            ▪ Dopamine Hydrochloride (Dopamine)
            ▪ Norepinephrine Bitartrate (Levophed)
         o Hemodilutional -- Hct of 30-33
         o Hypervolemic -- CVP of 8-12
      • Calcium Channel Blockers
      • Nimodipine: 60 mg PO q 4 hours for 21 days
      • NO Heparin, Coumadin, or ASA

V. ENCEPHALITIS: INFLAMMATION OF THE BRAIN

Etiology (usually viral)

a. Herpes Simplex 1
b. Arbovirus (Mosquitoes)
c. West Nile, Eastern and Western Equine, St. Louis
d. Enterovirus
e. Polio, Coxsackie's
f. Measles, Mumps, Rabies
g. Cytomegalovirus, Varicella-Zoster
h. Immunocompromised

Clinical Presentation

a. Personality Changes
b. Behavioral Changes
c. Altered LOC
d. Focal Neurologic Deficits
e. Hallucinations (olfactory and gustatory)
   • Classic Sign of Herpes Encephalitis
Management

a. ABCs
b. Supportive Care
c. Herpes Simplex 1 Encephalitis, Acyclovir
d. Seizure Management
e. Fever Management
f. Pain Management

VI. ENCEPHALOPATHY
Generalized or Global Mental Status Dysfunction

Etiology

a. Direct Pathology in Brain
   • Cerebral Blood Flow Disruptions
   • Structural Changes/Injuries
   • Concussive Brain Injury
   • Electrical Activity Changes
   • Neurotransmitter Changes
   • Ischemic Injuries to Tissue
b. Indirect Pathology
   • Toxin Buildup (renal, Hepatic)
   • Metabolic Imbalance
   • Severe Systemic Hypertension
   • Hypo/Hyper Glucose (acute and chronic)
   • Chronic Alcohol Abuse (Wernicke’s)

Clinical Presentation

Not a specific disease but results from neurological or systemic disorders. S&S are directly related to primary cause.

a. Change in: LOC, Behavior, Personality, Memory
b. Renal Insufficiency Symptoms
c. Liver Dysfunction Symptoms

Management

a. ABCs
b. Seizure Precautions/Prevention/Management
c. Safety Concerns/Issues
d. Behavioral Health Control
  e. Identification/Management of Primary Problem
  f. Supportive Care

VII. Seizures

Definitions

a. Seizure: Uncontrolled Discharge of Neurons Which Interferes With Normal Function
b. Epilepsy: Recurrent, Spontaneous Seizures
c. Status Epilepticus: Recurrent Seizures Before Recovery to Baseline

Etiologies & Predisposing Factors

a. Structural Changes
   • Trauma
   • Infections
   • Intracranial Masses
b. Cerebrovascular Disease
   • Hemorrhage
   • Ischemic Stroke
c. Metabolic Factors
   • Fluid and Electrolyte Imbalance
   • Hypoxia
   • Acidosis
   • Toxic Exposure
   • Drug Overdose/Withdrawal

Classifications

a. Partial Seizures
   • Simple Partial
     o One Hemisphere
     o No Loss of Consciousness
   • Complex Partial
     o One Hemisphere
     o Loss of Consciousness
   • Partial Seizures Evolving into Generalized Seizures
b. Generalized Seizures
   - Absence (Petit Mal): Staring Spells
   - Myoclonic: Single Jerk
   - Atonic: Drop Attack
   - Clonic: Rhythmic Jerking
   - Tonic: Stiffening
   - Tonic-Clonic (Grand Mal)

Phases

a. Pre-ictal Phase
   - Aura
   - Nausea
   - Confusion
   - Visual or Auditory Changes
   - Precipitating Events
b. Ictal Phase
   - Assess
   - Type
   - Sequence of Events
   - Character of Movements
   - Autonomic Signs
     - V/S, Respiratory Changes, Incontinence, Salivation, Diaphoresis
   - Consciousness

Assessment

a. History
b. Labs
   - CBC, Chem 20, LFTs, U/A
   - Lactic Acid, ABG
   - Tox screen
c. Imaging
   - CT
   - MRI
d. EEG
Interventions

a. ABC’s
b. Control Seizure:
   
   **Lorazepam (Ativan)**
   - Enhances the Inhibitory Neurotransmitter (GABA)
   - Rapidly Crosses the Blood-Brain Barrier
   - Remains in the Brain Longer Than Diazepam (Valium)
   - Cleared by the Liver
   - 2 to 4 mg IV STAT
   - Maximum Dose = 8 mg

   **Anticonvulsants (Antiepileptic Drugs – AED)**
   - If Already on an AED, Draw Level
   - Phenytoin (Dilantin)
   - Carbamazepine (Tegretol)
   - Fosphenytoin Sodium (Cerebryx)
   - Remember – Whatever the Patient was on Was NOT Enough
     - Phenytoin (Dilantin) Level 10 – 20mcq/ml
   - Consider Adding Additional Agents Immediately
     - Barbiturates
     - Pentobarbital (Nembutal)
     - Short Acting Anesthetic
     - Suppresses Neuronal Activity
     - Significant Respiratory Depressant
     - IV Bolus or Cont. gtt

c. Nursing Care
   - Seizure Precautions
   - Airway
   - Safe Environment
   - Don’t Restrain
   - Don’t Leave the Patient
   - Observe..Observe..Observe
   - Monitor..Monitor..Monitor
   - Reassure Patient and Family

Acknowledgement:
Thanks to Joseph Haymore, RN, MS, CNRN, CCRN, ACNP, CRNP for assistance with this content outline and lecture.
I. INTRODUCTION

PCCN Test Plan

*Neurological, Multisystem & Behavioral: 15%*

a. Altered Mental Status
b. Delirium
c. Dementia
d. Psychological Disorders
   - Anxiety Disorders
   - Depression
e. Substance Abuse
   - Alcohol Withdrawal
   - Chronic Alcohol Abuse
   - Chronic Drug Abuse
   - Drug-Seeking Behavior

II. ASSESSMENT (PSYCHOSOCIAL)

a. Acute Care Hospitalization is a Potential Crisis for Pt and Family
b. Pre-Existing Mental Health Diagnosis
c. Undiagnosed Mental Health Problems
d. Pre Hospitalization Coping Skills
e. Anxiety Level
f. Scope of Control/Powerlessness
g. Sources of Support
h. Life Cycle Stage (Erikson)
i. Maslow’s Stage
j. Family Stress
k. Cognitive Level
l. Sleep Deprivation
m. Synergy: Resiliency, Vulnerability, Resource Availability
n. Pain Level
o. Grief and Loss
p. Fear Level
q. Attention Level
r. Ability to Retain Information
s. Physical Symptoms of Mental Stress
III. DELIRIUM

Definitions

Delirium
“Rapid onset and fluctuating course, the symptoms of delirium include disturbances in consciousness and attention and changes in cognition, such as memory deficits or perceptual disturbances.” American Psychiatric Association DSM-IV

Perceptual changes such as hallucination, illusions and delusions are not required for the diagnosis of delirium.

Dementia
Gradual onset of memory impairment and cognitive disturbances. Slow steady decline in cognitive function. Can be organic or metabolic in etiology but typically not reversible and often not treatable.

Incidence: (delirium)

a. 20% – 50% of All Hospitalized Patients
b. Undiagnosed in 66%-84% of Hospitalized Pts
c. 20-80% Rate in ICU Patients
d. 87% of Ventilated Patients
e. Associated with Increased Mortality, Morbidity, Hospital Stay and Over All Costs

Etiologies & Predisposing Factors

a. Cognitive Impairment
b. Electrolyte Imbalance
c. Dehydration
d. Hyperthermia
e. Sleep Deprivation
f. Restraint Use
g. Medications
h. Vision and/or Hearing Problems
i. Infection
j. Malnutrition
k. Age >65
l. Withdraw Syndromes
m. Acute CNS Problems
n. History of:
   - Depression
   - Dementia
   - Stroke
   - Seizures
   - ETOH Abuse

o. Medical History of
   - Renal Failure
   - Liver Failure
   - CHF
   - HIV
   - Endocrine Disorders

**Clinical Presentation**

a. Disorientation/Confusion
b. Decreased Attention Span and Ability to Focus
c. Hyperactive Type
   - Restlessness
   - Agitation
   - Does Not Follow Commands (leave catheter alone or in place)
   - Wide Mood Swings
   - Attempting to Get Out of Bed
d. Hypoactive Type (more common, worse outcome)
   - Lethargy
   - Withdrawal
   - Decreased Responsiveness

**Treatment Options**

a. Prevention!
b. Early Identification of Risk Factors
c. Accurate Assessment/Diagnosis (Delirium Scales)
d. Treatment/Modification of Risk Factors/Cause
e. Review all Medications as Possible Cause
f. Treat Electrolyte and Metabolic Derangements
g. Non-Pharmacological
   - Repeat Orientation
   - Sleep Protocol
   - Early Mobilization
   - Minimal Restraint Use
   - Pain Control
   - Cognitive Stimulation
h. Pharmacological (can cause and/or treat)
   - Benzodiazepines
   - Narcotics
   - Haloperidol (FDA approved for Delirium)
   - Antipsychotics
   - Neuroleptics

IV. DEPRESSION

Definition

An abnormal emotional state characterized by exaggerated feelings of sadness, melancholy, dejection, worthlessness, emptiness and hopelessness that are inappropriate and out of proportion to reality. The overt manifestations, which are extremely variable, range from a slight lack of motivation and inability to concentrate to severe physiologic alterations of body functions and may represent symptoms of variety of mental and physical conditions, a syndrome of related symptoms associated with a particular disease, or a specific mental illness.

- Mosby’s Medical Dictionary

Etiology and Predisposing Factors

a. Fear & Anxiety Related to Current Events/Illness
b. Response to Loss and/or Grief and/or Deprivation
c. Diminished Self-Esteem
d. Guilt – Real or Perceived
e. Metabolic Causes
   - Electrolyte Imbalances
   - Endocrine Dysfunction
   - Neurotransmitter Imbalance
   - Medication Derived
   - Chronic Pain
f. Sleep Deprivation

Clinical Presentation

a. Agitation → Lethargy
b. Inability to Concentrate
c. Inability to Focus
d. Change in Sleep Patterns
e. Severe Fatigue
f. Signs of Sadness/Hopelessness
g. Thoughts of Death
h. Suicide Ideations
Treatment Options

a. Counseling
b. Significant Other Support
c. Rule Out Organic/Metabolic Causes
d. Antidepressants

V. MENTAL ILLNESS

Mental illness might be a chronic comorbidity of the hospitalized adult. This adds an increase challenge to nursing care requirements for patients. Informed consent, adherence and patient education are more difficult if the patient does not have a full concept of reality.

Types of Disorders (DSM IV)

a. Psychotic – ex. Schizophrenia
b. Personality Disorders – ex. Antisocial, borderline, narcissistic
c. Anxiety – ex panic attacks, phobias, obsessive compulsive
d. Developmental/Learning – ex autism, ADHA, retardation
e. Cognitive – ex dementia & delirium
f. Mood – ex depression

Nursing Priorities

a. Identify and seek appropriate and timely psychiatric assistance
b. Safe Environment
c. Identify and treat cause (if possible)
d. Determine if There is a Risk of Injury
e. Orientation
f. Assist with
   • Crisis Management
   • Stress Management
   • Coping Skills
   • Social Support
g. Pharmacological Management- antidepressants, antipsychotics, antianxiety agents
h. Patient/Family/Support System Education
i. Discharge Planning
VI. SUBSTANCE ABUSE

Commonly Abused Substances

a. Alcohol
b. Nicotine
c. Narcotics
d. Marijuana
e. Amphetamines
f. Benzodiazepine
g. Cocaine

Nursing Care Concerns/Priorities

a. Physical and/or Mental Dependence
b. Physical and or Mental Withdraw Symptoms
c. Assessment of Cause (recreational vs medical vs pain management)
d. Current State of Health
e. Current Nutritional State
f. Pharmacological Considerations ie tolerance and cross tolerance
g. Diagnosed or Undiagnosed Mental Health Issues
h. Ability for Self Care Post Discharge
i. Patient Education and Adherence
j. Appropriate Addiction Referral
k. Community and Social Support

Alcohol Withdrawal

Autonomic hyperactivity symptoms such as tachycardia, anxiety/agitation, dysphoric mood, diaphoresis, hypertension, sleeplessness and fine tremor are common physical findings when alcohol is abruptly stopped and typically will present within 2 days of cessation. Nausea, vomiting and hallucination may also occur.

Clinical Presentation for Delirium Tremors (72-96 hr Post drink)

a. Anxiety and/or Panic Attacks
b. Disorientation/Confusion
c. Insomnia
d. Disorganized Thought Processes
e. Visual and/or Auditory Hallucinations or Illusions
f. Tactile Hallucinations
g. Delirium
h. Tachycardia
i. Tachypnea
j. Fever
k. Seizure Activity

**Treatment Options**

- Anticipate/Prevent – Prophylactic Withdraw Regimen
- Safety Measures for Patient, Family, Staff and Therapeutic Devices
- Decrease Stimulation
- Utilize Short Directed Conversations
- Nonthreatening and Supportive Approach
- Hydration
- Monitor Vital Signs and LOC
- Medications
  - Benzodiazepines (Lorazepam, Diazepam, Chlordiazepoxide, Oxazepam)
  - Nutrition Support (MVI, Thiamine, Folate)
  - Neuroleptic (Haloperidol) (lacking research but used)
  - IV Ethanol
  - Propofol (lacking research but used)

**Sedative Withdrawal**

Physical withdraw signs and symptoms similar to ETOH. Treatment is different and will typically have to continue post discharge from the critical care setting. The patient is slowly “weaned” off the drug or transitioned to a longer acting agent like Chlordiazepoxide (Librium) or Diazepam (Valium) and then tapered off drug.

**Chronic Opiate Use: Clinical Presentation (withdrawal)**

- Yawning
- Extra Fluid Production (Tearing, Rhinorrhea, Diaphoresis)
- Mydriasis & Myalgia
- Tremors
- Abd Cramps, Nausea, Vomiting, Diarrhea
- Involuntary Leg Movements (kicking)
- Piloerection
- Muscle Cramping
- Vital Sign Changes: Fever, Hypertension, Tachycardia

**Treatment Options**

- Methadone – switch to longer acting agent → wean
- Clonidine – block sympathetic hyperactivity
- Buprenorphine – alpha opiate receptor partial agonist