PATIENT CARE THEORY 2

UNIT 15: Part 2a Toxidromes

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Poisons Most often Associated with Fatality

ADULT

- Alcohol
- antidepressants
- anticholinergics
- stimulants (sympathomimetics)
- narcotics
- sedative/hypnotics
- cardiovascular drugs
- other

} Part 2a

} Part 2b

Alcohol

Alcohol

- Most widely used drug in Canada
  - ~80% of Canadians drank alcohol in the past year (Canada.ca, 2015)
- Most common substance abused
  - ~18% of all individuals experiencing addiction
  - Social drinking -> problem drinking -> true addiction/alcoholism
- Leads to multiple medical complications
  - Decreased lifespan 10-20 years
  - No socioeconomic boundaries

https://www.canada.ca/en/public-health/services/publications/chief-public-health-officer-reports-state-public-health-canada/2015-alcohol-consumption-canada.html

Alcohol

- **Red Flags**
  - Drinking early in the day
  - Drinking alone or in secret
  - Periodic binging
  - Loss of memory or “blackouts”
  - Tremulous and anxiety
  - Chronically flushed face and palms

Alcohol

- **Toxic effects**
  - Decreased LOA/LOC
  - Ataxia/balance problems -> trauma
  - Peripheral nerve damage – decreased sensation

Table 36-3 Medical Problems to Which People With Alcoholism Are Particularly Susceptible

Condition	Contributing Factors
Subdural hematoma	Frequent falls; impaired clotting mechanisms
GI bleeding	Irritant effect of alcohol on the stomach lining (leading to gastritis); impaired clotting mechanisms; cirrhosis of the liver, leading to engorgement of esophageal veins (esophageal varices)
Pancreatitis	Indirect effect of alcohol on the pancreas
Hypoglycemia	Damage to the liver, which normally mobilizes sugar into the blood
Pneumonia	Aspiration of vomitus occurring during intoxication and coma; suppression of immune system by alcohol
Hypothermia	Insensitivity to extremes of temperatures while intoxicated; falling asleep outside in the cold
Seizures	Effect of withdrawal from alcohol
Arrhythmias	Toxic effects of alcohol on the heart
Cancer	Mechanism not known (perhaps related to suppression of the immune system), but people with alcoholism are 10 times more likely than the general population to have cancer
Esophageal varices (abnormally enlarged veins in the lower part of the esophagus)	Develops when normal blood flow to the liver is blocked and blood backs up into smaller, more fragile, blood vessels in the esophagus; do not produce symptoms unless they rupture and bleed (a life-threatening condition that requires immediate medical care; can be fatal when not controlled)

Alcohol related Emergency

- Acute alcohol intoxication
  - Alcohol poisoning
  - Legal limit is <0.08% BAC (80mg/100mL)
  - @ 0.10% slurred speech and difficulty in limb coordination begins
  - Risk of death begins @ 0.20%
- Immediate danger from respiratory depression and aspiration

BLUE = Impaired Driver

RED = Legally Drunk Driver

Weight	Number of Drinks								
	1	2	3	4	5	6	7	8	9
100	0.032	0.065	0.097	.0129	.0162	0.194	0.226	0.258	0.291
120	0.027	0.054	0.081	0.108	0.135	0.161	0.188	0.215	0.242
140	0.023	0.046	0.069	0.092	0.115	0.138	0.161	0.184	0.207
160	0.020	0.040	0.060	0.080	0.101	0.121	0.141	0.161	0.181
180	0.018	0.036	0.054	0.072	0.090	0.108	0.126	0.144	0.162
200	0.016	0.032	0.048	0.064	0.080	0.097	0.113	0.129	0.145
220	0.015	0.029	0.044	0.058	0.073	0.088	0.102	0.117	0.131
240	0.014	0.027	0.040	0.053	0.067	0.081	0.095	0.108	0.121

This blood alcohol level chart is provided only as a reference guide and it should not be relied upon to determine whether you are capable of driving a vehicle. Please keep in mind that there are a number of variables that can influence whether you are legally qualified to drive.

Weight in pounds – This is a reference guide only!

Alcohol related Emergencies

- Withdrawal Seizures
  - Occur with sudden cessation of drinking
  - Occur within 12-48 hours following the last drink
- DT's (Delirium Tremors)
  - Usually start 48-72 hours following last drink (can be longer)
  - Serious and potentially fatal
    - Characterized by excess catecholamine release
    - S&S: confusion, tremors, hallucinations, tachycardia, hypotension (usually associated with dehydration), fever, diaphoresis

ANTIDEPRESSANT OVERDOSE

Cyclic Antidepressants (CAs)

- Bicyclic antidepressants
  - selective serotonin reuptake inhibitors (SSRIs)
- Tricyclic antidepressants (TCAs)
- Common uses:
  - Major depression
  - enuresis
  - obsessive-compulsive disorder (OCD)
  - attention-deficit hyperactivity disorder
  - phobia, and separation anxiety in pediatric population
  - Adults: neuralgic pain, chronic pain, and migraine prophylaxis

SSRI's

- Considered safer than other antidepressants
- Fewer anticholinergic effects and cardiac effects
- Overdose S&S
  - Confusion
  - Lethargy
  - Nausea and GI upset
  - Less common; short lived seizures

Serotonin Syndrome

- Caused by an accumulation of serotonin in the body
- Unusual condition associated with excess medication use or change in medications
- Can be fatal if severe
- Vague symptomology
  - S&S include:
    - Confusion, agitations
    - Increased HR and BP, body temp
    - Muscle rigidity
    - Diaphoresis and shivering
- Supportive care including cooling if patient is hyperthermic

Clinical Effects of TCA Overdose

CVS

- decrease the sodium influx through the fast sodium channels
  - Decreases slope of phase 0, leads to QRS widening
  - Impairs cardiac conduction system
- decrease myocardial contractility
- profound hypotension
  - mainly a result of anti–alpha-adrenergic effect & direct myocardial depressive effects
- Tachycardia - Palpitations
- Chest pain
- Hyper/hypotension
- Bradycardia + widening of QRS = ominous sign (severe Na channel blockade), +ve R wave in aVR

TCA's (Tricyclic Antidepressants)

- Were at one time the most common choice for treatment of depression
- Affect many different neurotransmitters
- Usually prescribed only when other safer medications have not been effective
- Signs of OD or toxicity may vary dramatically among patients

Clinical Effects of TCA Overdose

CNS

- Convulsion
- Decrease mental status
- Respiratory depression
- Drowsiness
- Coma

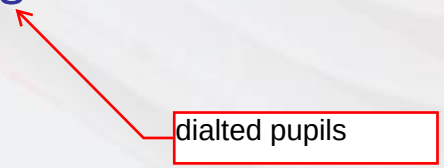
Clinical Effects of TCA Overdose

Peripheral autonomic system (anticholinergic effects)

- Dry mouth
- Dry skin
- Urinary retention
- Blurred vision

Clinical Effects of TCA Overdose

- **Physical:** Physical findings are usually consistent with the ***anticholinergic toxidrome***
  - Tachycardia
  - Hypotension and orthostasis
  - Fever
  - Altered mental status
  - Ileus (intestinal atony)
  - Rigidity
  - Dry skin and mucous membranes
  - Mydriasis



TCA Overdose

Management

- Support ABCs
- SpO_2
- O_2
- PPV prn, intubation prn
- CBG for altered LOA
- ECG!

Call for ACP

- IV access, Fluids for hypotension, $NaHCO_3$

ANTICHOLINERGIC POISONING

Anticholinergic Poisoning

- common sources include antihistamines
  - Anti-motion sickness
  - cold, allergy and sleep medications
  - antimotility drugs
  - Antipsychotics
  - Antispasmotics
  - TCA's
  - plants (e.g. "magic mushrooms", Jimson Weed).
- may be caused by intentional overdose, inadvertent ingestion, medical noncompliance, and geriatric polypharmacy

Jimson Weed - recreational

Seeds cause hallucinations

Anticholinergic Poisoning

Toxidrome (nicotinic): Fixed dilated pupils, dry skin(no sweating)dry mucous membranes, increased heart rate, fever, urinary retention, hallucinations, delirium.

- classical presentation, although often subtle is:

Red as a Beet

Blind as a Bat

Hot as a Hare

Dry as a Bone

Mad as a Hatter

- central signs are progressive and include anxiety, agitation, lethargy, respiratory failure, seizures, coma and death.

Anticholinergic Poisoning

Management

- Supportive
- SpO_2, ECG
- O_2
- PPV prn
- CBG for altered LOA

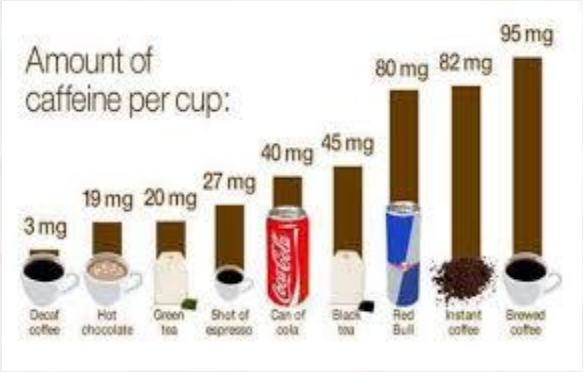
Call for ACP

- IV access, benzodiazepines for agitation and treatment of seizures, etc

STIMULANTS

Sympathomimetics

- common sources include cocaine, theophyline, amphetamines, crystal meth, PCP, LSD, Caffeine
- sympathomimetic = Hyperadrenergic



Sympathomimetics

- cardiovascular and metabolic toxicity has been attributed to catecholamine excess
- ↑ catecholamines may cause hypokalemia and hyperglycemia (seen in acute poisonings)
- respiratory alkalosis may occur with stimulation of the respiratory centre.

Sympathomimetics

- agitatation secondary to cerebral excitation
- hyperreflexia is common - in worse cases, seizures may occur
- permanent brain injury is common after seizures.
- one major theory for seizures in these cases includes cerebral vasoconstriction

Sympathomimetics

e.g. Cocaine

- hyperthermia
- seizures
- vasospastic angina / AMI
- stroke
- delirium
- N/V
- palpitation
- diaphoresis +++
- paranoia
- anxiety
- panic
- intense high…intense low
- death

Sympathomimetics

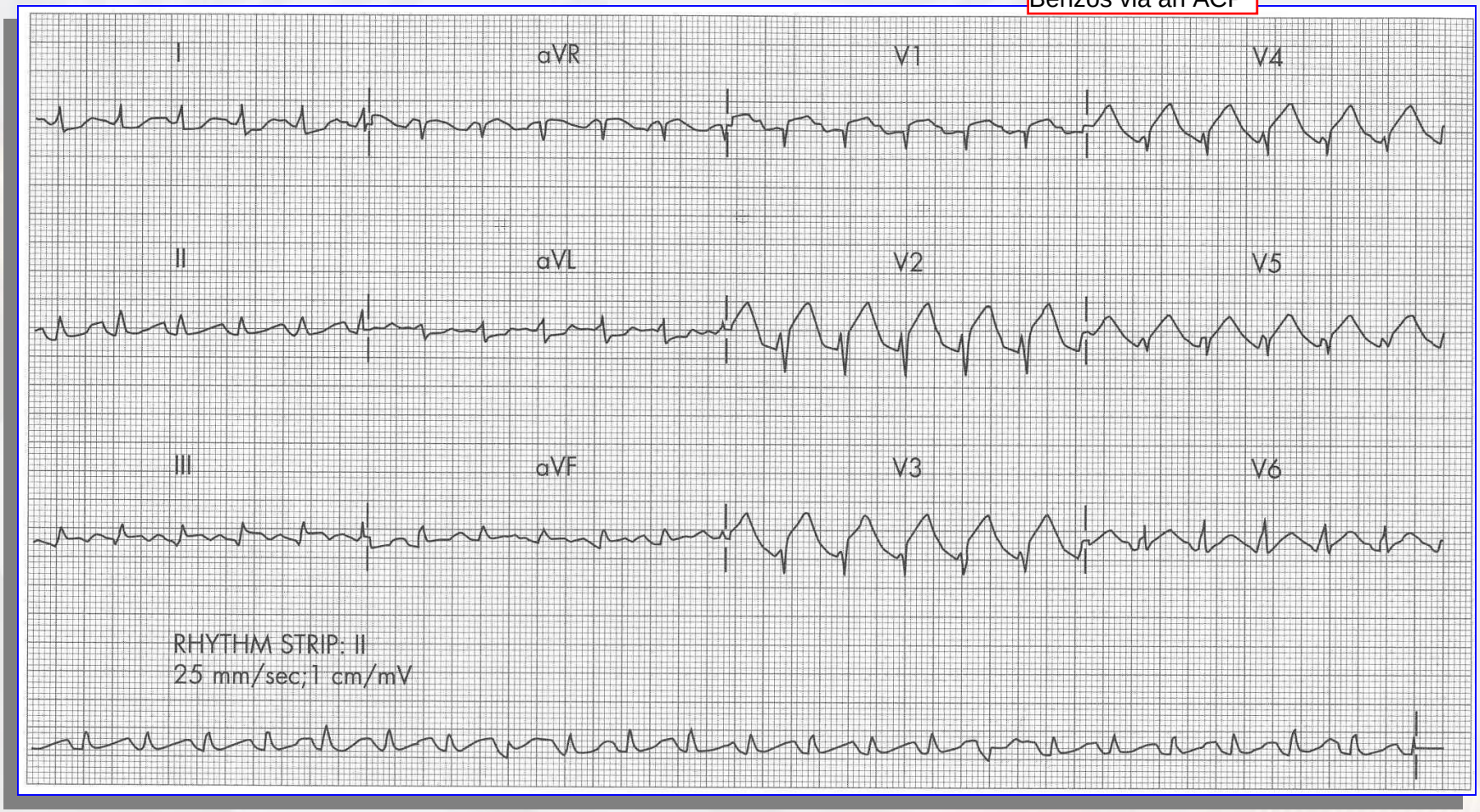
Cocaine: Fatal dose

- mixing alcohol with cocaine = cocaethylene which has a 40 x potency than cocaine alone
- This increases the risk of sudden death x 20

Cocaine: cardiogram

v2, v3, v4 Stemi

Cocain+alcohol caused this STEMI, so rathe rthan a clot , the ischemia is due to constriction. To treat, nitro wont work, you need Benzos via an ACP



34 y/o male, cocaine user with an acute anterior MI

Sympathomimetics

Management

- ABCD
- **Cooling measures for hyperthermia**
- SpO_2, ECG
- O_2
- CBG for altered LOA
- Head to toe (look for associated trauma)
- serial 12 Lead ECG
- Treat chest pain as per Directives

Call for ACP

- IV, fluids, **Sedation with benzodiazepines,** $NaHCO_3$ for VT

QUESTIONS?