

Section 2

Central East Prehospital Care Program

Summer 2008

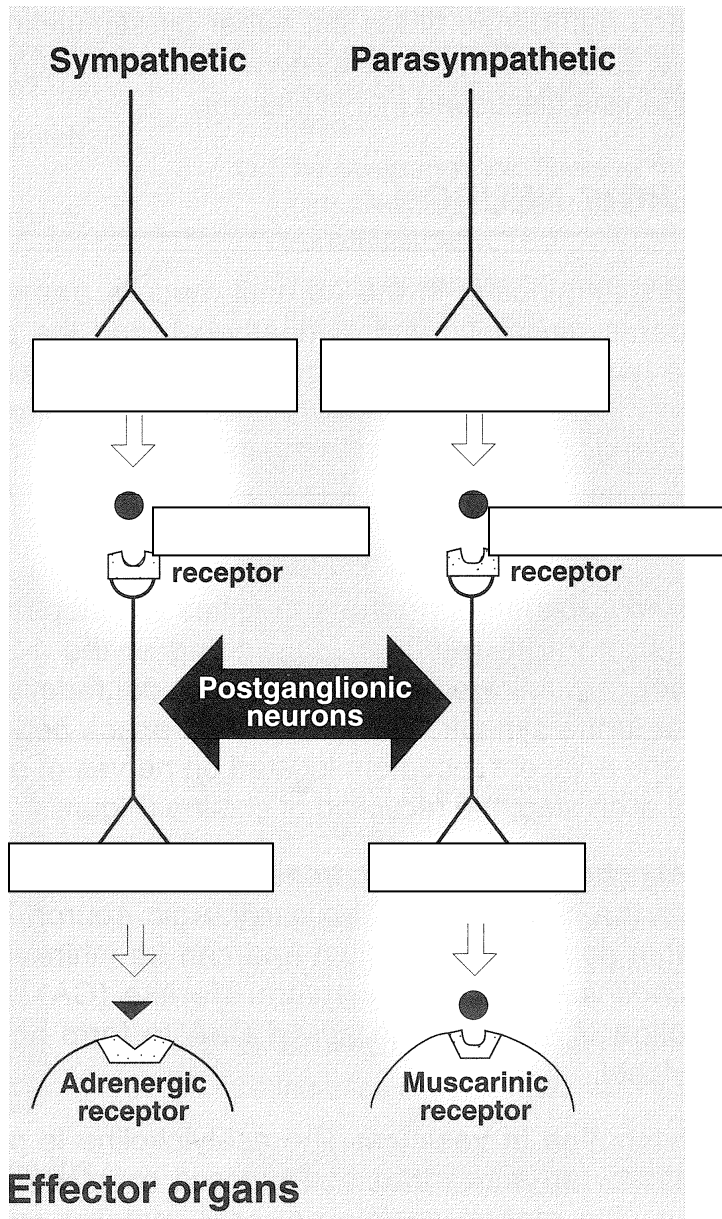
Toxidromes

Self-Study Exercises

1)

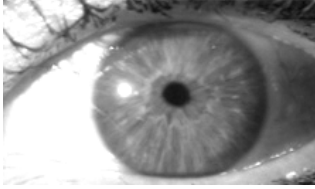
What two types of receptors can be triggered by acetylcholine?

2) Fill in the boxes below with the appropriate neurotransmitters and receptors.



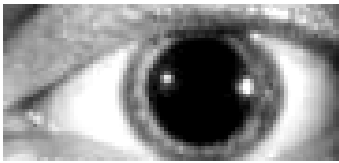
3) What three different types of adrenergic receptors are there?

4) Match the following sign and symptom to the correct autonomic nervous system response:



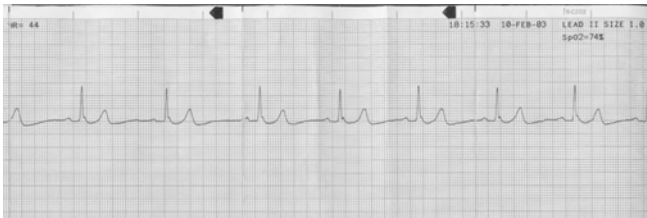
This is indicative of a _____ response.

Miosis



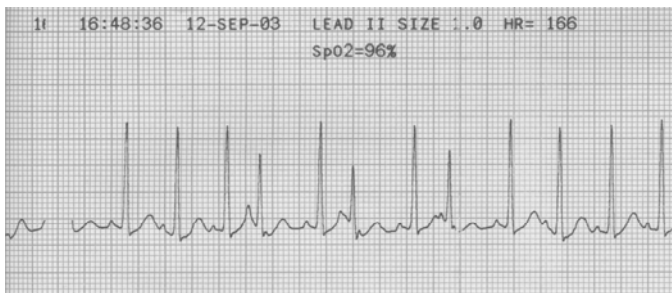
This is indicative of a _____ response

Mydriasis



This is indicative of a _____ response.

Bradycardia, slowed AV conduction



This is indicative of a _____ response.

Tachycardia, cardiac irritability



This is indicative of a _____ response.

Sweating, pale, cool skin

5)

You are responding to a priority 4 call in a local subdivision. A 16 year old female has overdosed on Gravol. When you arrive she seems to be unresponsive.

If she has indeed overdosed on Gravol, you would expect to see the following signs and symptoms:



Pupils: _____

Heart rate (high or low): _____

Skin colour / Condition: _____

Respirations (decreased, increased or normal): _____

Sure enough, she seems to fit the bill...what complications would you prepare for en-route to hospital?

6)

You are called on a priority three to a local nursing home. A male patient has a decreased level of consciousness, you assess the patient and find the following notable findings:

Pinpoint pupils, respiratory rate of 6/min, only rouses to forceful tactile stimuli.

Your partner starts ventilating via BVM. The staff acknowledges that the doctor recently adjusted one of the patient's medications; they are not sure *which* medication. They hand you a MAR sheet. Which one of the drugs listed on the MAR sheet on the following page would you suspect has been adjusted (circle your answer)?

MEDICATION ADMINISTRATION RECORD

MEDICATIONS	HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Divalproex 500 mg 1 tab BID																																
Clonazepam 1 mg 1 tab TID																																
Diltiazem 180 mg 1 cap QD																																
Duragesic 100 mcg/hr PRN																																
Fosinopril 40 mg 1 tab every AM																																
Gabapentin 300 mg 1 cap TID																																
Lovastatin 20 mg 1 tab after supper																																

MEDICATIONS	HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							
NURSE'S ORDERS, MEDICATION NOTES, AND INSTRUCTION ON REVERSE SIDE																																							
CHARTING FOR MONTH:																Page of																							
Primary Care Physician:																Telephone No.																							
Specialist(s):																Telephone No.																							
Allergies: Adverse Drug Reactions:																Pharmacy: Telephone No.																							
Diagnosis:																																							
Medicaid Number								Medicare Number								Complete entries checked By:								Title:								Date:							
Patient:																Location:																							

7)

One in five Ontario high school students admit to having used the following class of medication recreationally;

Which toxidrome does the drug belong to?

Which signs and symptoms would you expect if a patient overdosed on this type of medication?

Pupils: _____

Heart rate (high or low): _____

Skin colour / Condition: _____

Respirations (decreased, increased or normal): _____

8)

Match the drug to the correct toxidrome:

- | | |
|-------------------------------------|---------------------|
| a. Anticholinergics | ___ Cocaine |
| b. Sympathomimetics / Withdrawal | ___ Heroin |
| c. Opiate / Sedative | ___ Jimson Weed |
| d. Cholinergic / Anticholinesterase | ___ Ritalin |
| | ___ Ecstasy |
| | ___ Fentanyl |
| | ___ Oxycodone |
| | ___ Benadryl |
| | ___ Red Bull |
| | ___ Methamphetamine |
| | ___ Codeine |

9)

Match the sign and symptom to the correct toxidrome (may be more than one correct toxidrome, for each S & S):

- | | |
|-------------------------------------|-------------------------|
| a. Anticholinergics | _____ Hot, flushed skin |
| b. Sympathomimetics / Withdrawal | _____ Diaphoresis |
| c. Opiate / Sedative | _____ Mydriasis |
| d. Cholinergic / Anticholinesterase | _____ Miosis |
| | _____ Hallucinations |
| | _____ Tachycardia |
| | _____ Slow resp's |
| | _____ Salivation |
| | _____ Goosebumps |
| | _____ Hypothermia |

10)

The following two toxidromes are most likely to trigger excited delirium;

11)

On December 18th 1998, Comedian Chris Farley was found by his brother, lying on his apartment floor, dead. Toxicology reports performed during autopsy revealed both cocaine and heroin in his blood

(http://en.wikipedia.org/wiki/Chris_Farley)



http://www.onmilwaukee.com/images/articles/fa/farley/farley_story1.jpg

What is the combination of those two drugs called?

What are the risks in treating this type of overdose?

12)

On October 26th 2002, Russian Special forces stormed a theater in Moscow where Chechen rebel fighters had held 800 people hostage for two and a half days.

Prior to entering the building the Special Forces members released a weaponized form of aerosolized Fentanyl into the air-conditioning ducts leading into the theater (Wax, Becker & Curry 2003)

The hostages and many of the rebels (some had gas masks and were not affected by the gas) were pulled out of the theater unconscious (Wax, Becker & Curry 2003)



*Unresponsive victim on bus.
(Sutcliffe 2002)*

The authorities were ill prepared to deal with the victims and many were simply placed, unconscious, on transit buses and transported to hospital. Approximately 200 civilians died in the rescue attempt (Wax, Becker & Curry 2003)

Which toxidrome killed the victims?_____

If you could assess the patient in the picture's pupils what would you expect to see?

What treatment might have saved their lives?_____

13)

Tom Gugliotta, a former professional basketball player gives the following account of a drug that he ingested in 1999, writing in ESPNMAG.com:

'I took something without knowing what it was, and it almost killed me. A product advertised as a "sleep aid" -- and claiming to help muscles recover from exercise -- sent me into a seizure, caused me to lose bowel control and left me unable to breathe unaided.

I'd been having trouble sleeping after games, staying up until 3 or 4 in the morning. A friend told me about a liquid supplement that might help, and sent me a bottle. The night in Portland was the second time I'd used it. Then, it was still legal. What happened next helped move the government to take it off the market.



After the game, I showered, had a soft drink, filled the dropper in the bottle to 5 milliliters and took the stuff. I got on the team bus and called my wife, Nikki. As I talked, it felt like low voltage electricity was going through my body. I heard a humming noise in my head. the skin on my face started twitching. I was feeling a little loopy and queasy. That's how I imagine an OD would feel -- like I took a drug, but skipped passed any buzzed feeling and went straight to sick.

Nikki says I started babbling. I could tell I was passing out, and didn't want her to hear, so I tried to cut off the cell, but I guess I dropped it. Still on the line, Nikki heard my teammates yelling for an ambulance. The trainer started slapping my face, but my eyes kept rolling back and my chin dropped to my chest. Luckily, there was still an EMT crew around. As they were taking me from the bus to the ambulance, I started foaming at the mouth and shaking. That's what the stuff can do to you. It knocks you out and slows your breathing, sometimes to the point of stopping it.

And that wasn't the scariest part. Waking up was. I bolted uprights in a hospital bed in Portland, fighting for breath and almost choking on the tube in my throat. Doctors and nurses were saying, "Relax, don't try to breathe, let the machine do it." They were telling me not to breathe. I thought they'd given up on me.

What drug did Tom take?_____

What signs and symptoms would you expect to see?_____

What treatment would you provide?_____

What finding, significant of this type of drug ingestion, might you see on the cardiac monitor?_____

14)

What two *receptors* act on the eye to produce miosis?

15)

Which two *toxidromes* can cause mydriasis?

16)

This drug will increase your chances of having a heart attack 24 fold in the 60 minutes after drug consumption;

References:

Wax, PM, Becker, CE & Curry SC 2003, 'Unexpected "Gas" Casualties in Moscow: A Medical Toxicology Perspective', *Annals of Emergency Medicine*, Vol. 41, No. 5, pp. 700-705

Sutcliffe, J, 'Female hostage of Moscow theater siege', *The Sunday Telegraph/Images Sans Frontières*, United Kingdom,