Actions and Algorithms for Medical Emergencies:
or
How to Save a Life, Including
Your Own

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Daniel G. Pompa, D.D.S.
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"Update in Basic Physical Diagnosis"
- Inventor: U.S. Patent: 5,320,529
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Neither my immediate family nor I have any financial interests that would create a conflict of interest or restrict my independent judgment with regard to the content of this course

APS
ADVANCED PRACTICE SEMINARS
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Implications of medical screenings of patients arriving for dental treatment
The results of a comprehensive laboratory screening

ABSTRACT

Results of Miller Study

- 83% of patients had 1 or more abnormal reading
- 1 in 5 patients had significantly abnormal readings, e.g. LFT and creatinine levels (Liver and kidney dysfunction)
- 50% of patients with *Cardio Vascular Disease, Diabetes or both* had abnormal kidney function-(Creatinine or BUN levels)

Effects of Age on Renal Function

1% of function is lost every year after 40

Reduced ability to excrete drugs and metabolites -

Elevated elimination half/time for many drugs including Anesthetics and Antibiotics

CKD=GFR<60 for 3 months (> Creatinine Concentrations=<GFR)-requires dose reductions and/or lengthening dose intervals

Effects of Age on Hepatic System

Longer elimination half/times

Reduced dosage requirements with age as therapeutic level may approach toxic levels

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IOS = Index of Suspicion

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Peripheral Numbness (6)

Causes of Seizures (not from Epilepsy) (4)

When to give Supplemental Oxygen (8)

Causes of Syncope that are Iatrogenic (6)

www.NYSAGD

Winter 2014

2014 Update on Basic Physical Diagnosis:

Reducing the Occurrence of Many Medical Emergencies in the Dental Office

Dr. Daniel G. Pompa

Oral and Maxillofacial Surgeon

Today there are many medically compromised patients coming to our offices. The U.S. and global population demographics are constantly changing; chronic diseases are becoming more prevalent, new medications are being developed and brought to the market. Many of these patients are often treated in dental offices without adequate medical history and evaluation being taken prior to the onset of treatment.

It has been estimated that at least one or two office related deaths may occur during the career of a typical dental practitioner. These would not necessarily occur during the office visit, but could happen within 24 hours after the actual treatment.

The events behind majority of medical emergencies that occur in dentistry happen during or immediately after local anesthetic administration. Anything a doctor can do to minimize stress at this time serves to prevent potential problems from developing.

What is the #1 Emergency in the Dental Office?

The prevalence of hypertension appears to be between 30–45% of the general population*

Classification of Hypertension

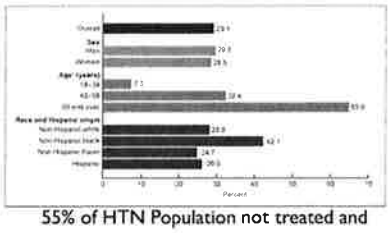
Category	Systolic mmHg		Diastolic mmHg
Optimal	<120	and	<80
Normal	120–129	and/ or	80–84
High normal	130–139	and/ or	85–89
Grade 1 hypertension	140–159	and/ or	90–99
Grade 2 hypertension	160–179	and/ or	100–109
Grade 3 hypertension	≥180	and/ or	≥110
Isolated systolic hypertension	≥140	and	<90

*Hypertension
Volume 2013 (2013), Article ID 410740, 8 pages
http://dx.doi.org/10.5402/2013/410740

Worldwide incidence: 1 Billion

over 50% untreated
only 20% under control

Hypertension breakdown



55% of HTN Population not treated and

only 20% of diagnosed HTN pt's are controlled.

The Dental Society has shown that up to 25% of DDS's are now recording BP

Hypertension…

One in three adult Americans have Hypertension

2/3's of individuals who have their first heart attack have Hypertension (69%)

3/4's of those who have a first stroke have Hypertension (77%)

"Careful and constant monitoring of cardiovascular and respiratory (adequacy of ventilation) vital signs, and the patient's state of consciousness should be performed after each local anesthetic injection"

Hypertension: Prevention

Even if controlled with meds - still more likely to have complications of HTN vs. if able to bring it under control without meds

Hypertension: Prevention

Wt. loss = for every - 2 lbs. - 1 mm Hg

Minimum of 30 minutes/day exercise or 3 (10) minute cycles - 4 mm Hg

Alcohol use* 1 glass 5 oz wine - 4 mm Hg
*If over 5 oz = raises BP especially for men

Cut down Salt intake = up to - 8 mm Hg

Hypertension: Prevention

AHA Recc: 1,500 mg. Sodium/day (average intake is 4,000 mg.)

UK did a study from 2003-2011* whereby they decreased the consumption by 15% and found a 42% reduction in Stroke and 40% reduction in Heart Disease

Note: only 10% of Sodium is in Salt we add

*British Medical Journal Open, April 14, 2014

Hypertension

Increasing Age will almost always cause an increase in Blood Pressure

End organs of HTN are Brain, Heart, Kidney and Eyes.

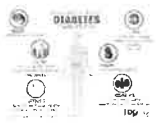
End Organs for DM are:

Eyes - Must be below 7 A1c

Kidney - Must be below 7 A1c

Cardiovascular - Should be 6.5 A1c

- **Nerves: Neuropathy Must be below 7 A1c**
- **Teeth and Perio Disease**



U.S. = Overweight

BMI = 25 - 29.9 = OW

Over 30 = Obese

How to measure?
Take your weight in lbs. X 703 and divide by your height in inches (squared)

-10 lbs. = 5 mm Hg decrease in Systolic BP

It is no longer a Cardiac Risk Factor it is now a Coronary Artery Disease Equavalent

10% of U.S. Population but

Over 60 years old = 30% of population and

1/3 (33%) are not treated = 10 Million

Low Blood Sugar

Average person with Type 1 DM experiences Hypoglycemia **up to 2 times a week**

If untreated or ignored can lead to Seizures and Coma with potential for:

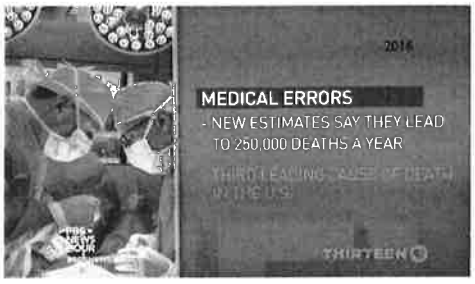
Cardiac Arrest - Death

Other Hypoglycemia causes:

- not eating enough
- exercising more than usual
- drinking alcohol without eating food

Leading Causes of Death

New # 3



Heart disease

1) Heart disease (MI,CA,CHF)

2) Cancer (malignant neoplasms)

3) New Category

3) Chronic respiratory disease

4) Accidents (unintentional injuries)

5) Stroke (**cerebrovascular diseases**)

6) Alzheimer's disease

7) Diabetes

8) Influenza and *pneumonia*

9) Kidney disease

10) Suicide

86,000,000 Americans
Pre-Diabetic

3

Adrenalin=Epinephrine

B_1=directly increases heart rate and cardiac output..

B_2=causes relaxation of smooth muscles in Lungs.....allowing open passages and more air exchange, and in the pupil—causes ciliary muscle relax - far vision focus and there is dilation of pupil

A_1=causes contraction/constriction of peripheral smooth muscle in arterioles---increasing blood pressure... (memory)

Prefrontcortex-Medien templobe-memory=ER & sleep. PTSD, Atenolol=Tenoren (B1) = selective & Propranalol=Inderal (B1&2) non-selective=can cause serious hypertensive crisis IV w/in 24 h; =PTSD memory

Red light flashing with following meds:

-Concerta, Methylphenidate
-Cymbalta, Duloxetine
-Seroquel, Quetiapine
-Lexapro, Escitalopram
-Neurontin, Gabapentin
-Levaquin, Levofloxacin

Viola

Careful use of Epi in LA for the following meds:

	BETA-ADRENERGIC BLOCKERS	Sympathomimetics epinephrine
OK	(a) Cardioselective	
	acebutolol	Monitan Rhotral Secteal
	atenolol	Tenormin
	metoprolol	Betaloc Lopressor
Caution	(b) Noncardioselective	
	nadolol	Corgard
	oxprenolol	Trasicar
	pindolol	Visken
	propranolol	Inderal
	sotalol	Sotacor
	timolol	Blocadren Timoptic
OK	(c) Noncardioselective and alpha blocker	
	labetalol	Trandate

IOS = Index of Suspicion

Mullers sign

- pulsating of uvula---indicating severe Aortic Insufficiency---Aortic Regurgitation
- pulsating occurs during systole and is due to an increased stroke volume.
- Also associated with widened pulse pressure

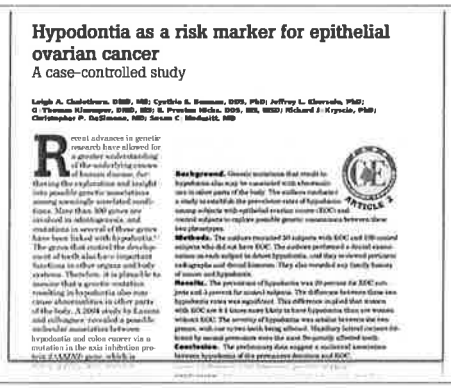
marph

Widened Pulse Pressure:

- Hypertension, Hyperthyroidism
- Aortic Valve Regurgitation and Aortic Insufficiency

JADA: 2008;139(2):163-9

Hypodontia as a risk marker for epithelial ovarian cancer
A case-controlled study



Hypodontia as a risk marker for epithelial ovarian cancer
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MEDICAL EMERGENCIES

- PREVENT
- PREPARE
- RECOGNIZE
- MANAGE

MEDICAL EMERGENCIES

- PREVENT
- PREPARE
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- MANAGE

Legal and moral obligation of Healthcare Provider (Professional)....

- Is to keep the patient alive until either recovery occurs or until help arrives to take over management*
  *Introducing: Blizzard Storm Scenario or B.S.S. = Hurricanes

1) Taking a good history is the key to avoiding over 75% of all medical emergencies
2) This includes basic vital signs (BP, Pulse)

3) Giving great local and testing it will reduce medical emergencies.....

because fear and unexpected pain can trigger:
-Hyperventilation
-Hypertension
-Angina attack
-Asthmatic attack
-Syncope
-Seizure

"Blink"

- author: **Malcolm Gladwell** (2005)
- Great decision makers are those who have perfected the art of "Thin-Slicing" = filtering the very few factors that matter from an overwhelming number of variables
  Goldman Cook County
- "Don't think-BLINK"
- D.J.!!!---((*))-MJ,P,WG,BJL,CriEv describ DJ event

Thin Slice-PD

- Gait of pt. walking into office
- eye contact or not=tension vs. relaxed
- shake hands=cold and dry vs. sweating and warm...(Hypothyroid vs. Hyperthyroid)
- face and forehead=cold, pale, sweating..pre syncope
- jugular vein distension - when upright, swollen ankles (CHF)
- breath sounds during conversation(Asthma)

With inability to walk up one flight of stairs + JVD = Oxygen

Exam at 20 paces...

- Color of Sclera in eyes
- Barrel Chest of COPD and Osteoporosis

Blue Sclera

thinness of collagen fibers

Hypothyroidism

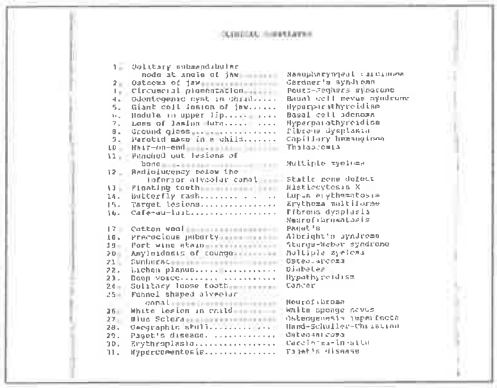
Osteogenesis Imperfecta (27)

Marfans Syndrome

Minocycline use (Tetracycline)

Adrenal Insufficiency (Addison's Disease)

Conjunctival Melanoma



1.	Solitary submandibular node at angle of jaw	Nasopharyngeal carcinoma
2.	Osteoma of jaw	Gardner's syndrome
3.	Circumoral pigmentation	Peutz-Jeghers syndrome
4.	Odontogenic cyst in angle	Basal cell nevus syndrome
5.	Giant cell lesion of jaw	Hyperparathyroidism
6.	Nodule in upper lip	Basal cell adenoma
7.	Loss of lamina dura	Hyperparathyroidism
8.	Ground glass	Fibrous dysplasia
9.	Parotid mass in 8 wks	Capillary hemangioma
10.	Hair-on-end	Thalassemia
11.	Punched out lesions of bone	Multiple myeloma
12.	Radiolucency below the inferior alveolar canal	Static bone defect
13.	Floating teeth	Histiocytosis X
14.	Butterfly rash	Lupus erythematosis
15.	Target lesions	Erythema multiforme
16.	Cafe-au-lait	Fibrous dysplasia
17.	Cotton wool	Paget's
18.	Precocious puberty	Albright's syndrome
19.	Port wine stain	Sturge-Weber syndrome
20.	Amyloidosis of tongue	Multiple myeloma
21.	Cementoma	Osteosarcoma
22.	Lichen planus	Diabetes
23.	Bony voids	Hypothyroidism
24.	Solitary loose tooth	Cancer
25.	Funnel shaped alveolar canal	Neurofibroma
26.	White lesion in cheek	White sponge nevus
27.	Blue Sclera	Osteogenesis imperfecta
28.	Geographic skull	Hand-Schuller-Christian
29.	Paget's disease	Osteosarcoma
30.	Erythroplasia	Carcinoma-in-situ
31.	Hypercementosis	Paget's disease

Pulse Oximeter

Auto-BP

Rate Pressure Product

(Systolic BP) X (Pulse) :

If over 12,000 suggests compromised ability of coronary arteries to supply oxygen to myocardium

(Systolic BP) X (Pulse) : =

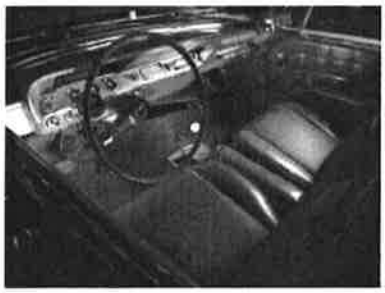
Rate Pressure Product (RPP)

HEART MUSCLE

RBC's give up 30% of their Oxygen to tissue but the heart muscle takes out

60% of the oxygen so it needs it and is more susceptible to less Oxygen than other areas.

IOS = Index of Suspicion



Four on the floor

- Asthma
- Angina
- Epilepsy
- Diabetes

Four on the floor

- Asthma
- Angina
- Epilepsy
- Diabetes

Four on the floor

- Asthma
- Angina
- Epilepsy
- Diabetes

Important questions to prevent emergencies; Conversational History

- Do you drive? Diabetic or Epileptic patients who are not well controlled do not drive (assuming they knew how to), also Alcoholic patients may have their license revoked.
- Can you walk up a flight of stairs or walk one block without stopping? Do you need multiple pillows below your head to sleep?

- For Diabetic patients:
  Maturity onset or type 1?
  Did you take you meds today?
  Did you eat?
  Ever been in the hospital for problems?
- For Asthmatic patients:
  what type-allergic, environmental, emotional, Do you have your inhaler?
  Ever been in the hospital for problems?

- For Epileptic patients:
  what type? (Grand Mal or Petit Mal)
  what is your aura?
  how often and when was your last attack?
  Ever been in the hospital for problems?
- For Angina patients:
  what are your signs and symptoms?
  how often do you get them?
  what do you do? how often do you use nitro?
- Ever been in the hospital for any problems?

Simple tests in office

- Blood Pressure (screening and medico-legal requirement-PIL listed in all Locals)
- Pulse Oximeter (Pulse and O_2 Saturation)
- Glucometer (Blood Sugar levels)
- A1c (levels of blood sugar over 3 month period)

Arrival Time	Appt. Time	Doctor or Department	New Patient (✓)	Any change in address/phone/ insurance since last visit?

DASH the ABC'S
must ask questions every time

DASH the ABC'S
must ask questions **every time**

Any New Drugs
Any Allergies
Any Surgeries
Any Hospitalizations

DASH the ABC'S
must ask questions every time

- Any New Drugs
- Any Allergies
- Any Surgeries
- Any Hospitalizations
- Aspirin regimen or sensitive to it
- Any Bleeding disorders or history
- Chest Pain - any history of
- Shortness of Breath

Oxygen as Premedication

Any Patient with Angina

If the RPP is over 12,000

Oxygen Saturation is below 93%

Patients with a history of seizures not responsive to meds

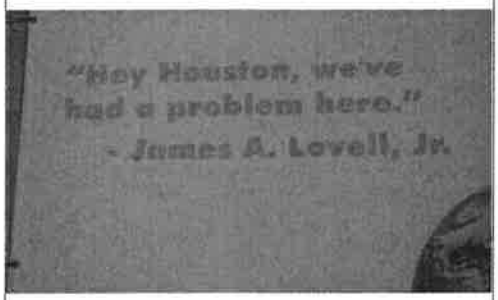
Oxygen as Premedication

Asthma and treated with Steroids and Anticholinergic meds

History of CHF + JVD + Exertional Dyspnea

Macho Man 16-30 years old - first visit for an extraction

History of an MI in the past 6 months



O.O.D.A.
~Observation
~Orientation
~Decide
~ACTION=MANAGEMENT back to apollo 13
prep is everything the Astro practice this 100X

Post it 911 internal code eg.
"126" ---55 y/o female severe chest pain
ang asin AGE Sex CC

Do not hesitate to call 911

Just Do It!

male vs. female

More Medical Emergencies:

- are occurring today because patients we see today enjoy medical advances not known just 20 years ago....
- Patients on Plavix
- Patients with portable Oxygen
- Patients with implanted defibrillators

Age of Population

As of 2014 46,200,000 million Americans are 65 or older

Will double in the future - 25-30 years

"This Population will present a much greater risk of a emergent CV event such as a MI or Stoke" (Chawla and Jaggi, 2016 Journal of Endocrinology and Metabolism)

Age of Population

As of 2014 46,200,000 million Americans are 65 or older

65% of population over 60 with HTN - and only 20% with Dx of HTN are controlled

1/3 of U.S. Population will soon be Pre-diabetic with 86,000,000 presently

30% of Population over 60 are Diabetic with 1/3 not diagnosed

Young Population

Incidence of Asthma in children and young adults is increasing (over a 30% increase in last 20 years - as of 2016) CDC, 2016

Alarming increase in the incidence of Type 2 Diabetes in children and adolescents with 1/3 of children as overweight and 17% are obese.

Young Population

"Both these groups are likely to experience serious health issues later in life"*

*Pulgaron, Current Diabetes Reports 2014
*World Health Organization, 2016

PABCD

P=Position,Position,Position...

A=Airway

B=Breathing

C=Circulation, Compressions

D=Definitive Treatment = Drugs, Defibrillation

Stress related Emergencies (HAS)

Hypertension

Hyperventilation

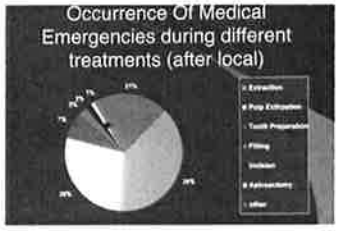
Asthma

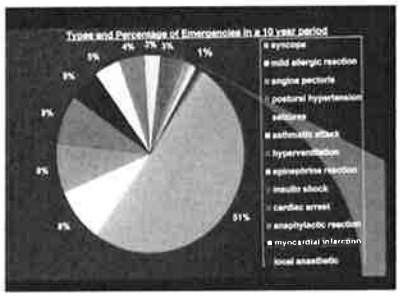
Angina

Anxiety Attack

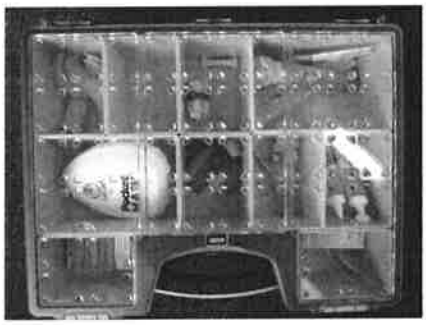
Seizures

Syncope





Note: placing the drugs where you want them with color coding, is in itself, a practice drill for the actual emergency



Speed of onset

IV: 15 to 30 seconds
IN: Equal to IV or up to 5 minutes
IM: 8- 20 minutes
SC: 15 - 30 minutes
PO: up to an hour

Basic (10) Emergency Kit

- Oxygen and "E" Cylinder with AMBU Bag
- Spirits of ammonia (crush and wave 12" under nose)
- Epi: as EpiPen 2-Pak (0.3mg of 1:1,000) and Epi solution for IM use (1:1,000) = has 0.3mg in 0.3cc or 0.3ml of solution—and also Epi Pen Junior = .15mg = 1/2 the dose.

- EpiPen 2-PAK has 2 doses and a Trainer

General Dentistry: Journal of the AGD

Nov/Dec Issue 2016: Vol 64, Number 6

pages 10-13

"Should you really have api-autoinjectors in the emergency kit?"

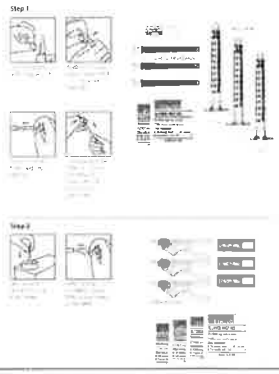
Dr. Jason Goodchild and Dr. Mark Donaldson conclusions from article——

Problems with Epi Pen -2Pak

Needle length short - must maintain for up to 5-10 seconds

Shelf life 12-18 months vs. Ampules and Vials - 2 years (more likely to be active)

2-Pak offers 2 doses BUT may need 3 doses as half life of Epi is short and waiting time may be long



http://epinephrinesnap.com

1 ampule of Epi = 1 cc = 1 ml

3 syringes

6 needles - 3 filter blunt and 3 safety

Alcohol preps

Basic (10) Emergency Kit

- **Benadryl Elixir** and Benadryl 50mg/cc for IM injection and 50mg. tablets
- Nitroglycerin spray (pump) or pills

Nitroglycerine

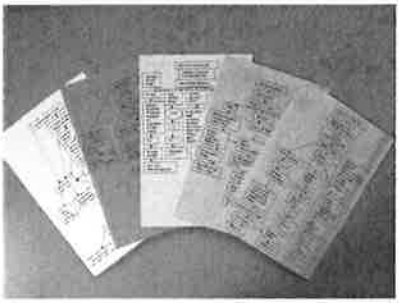
Basic (10) Emergency Kit

- Albuterol (ventolin or proventil), presently Pro-Air - 0.18 mg vs. 0.83 mg in a Nebulizer over 5 - 15 minutes.
- Glucose (insta-glucose, packets of sugar, soft drink), and GlucaGen which is Glucogon for IM/IN use--1.0mg/cc
- Aspirin (4 baby, 81mg. each) to be chewed then swallowed

Basic (10) Emergency Kit

- Nitrous Oxide 4l/4l = pain relief of Morphine 10mg
- Versed--IN use - 2.5mg/cc
  BSS Conditions - NYC -since 1978 - 11 since '78.
- Narcan: also IN use "Up to 2mg" BUT objective is to relieve Resp Depression not to awake. If too fast - violent and can show withdrawal with major SE's.

Newest additions all for IN use



Color Coding Emergencies

WHITE=Syncope (Fainting)

- YELLOW=Altered Consciousness-Insulin Shock=Hypoglycemia,Seizure,Hyperthyroid, Stroke, Drug Reaction, A.I., Hypotension
- GREEN=Allergic Reaction---Anaphylactic Shock
- RED=Cardiovascular=Angina, M.I., Cardiac Arrest
- BLUE=Respiratory=Hyperventilation, Asthma, Airway obstruction, P. E., C.H.F.

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- Singer and movie? This is a shout out
- Next is ? # 1

Rate Pulse Product (RPP) 3 part answer

- ???????? Blood Pressure (X) ?????
- If over ??,???indicates possible oxygen deficiency to the myocardium. Please do not shout out....Raise Hand.

Rate Pulse Product (RPP)

Systolic BP (X) Pulse

If over 12,000 indicates possible oxygen deficiency to the myocardium.

Oxygen as Premedication

Any Patient with Angina

If the RPP is over 12,000

Oxygen Saturation is below 93%

Patients with a history of seizures not responsive to meds

Oxygen as Premedication

Asthma and treated with Steroids and Anticholinergic meds

History of CHF + JVD + Exertional Dyspnea

Macho Man 16-30 years old - first visit for an extraction

History of an MI in the past 6 months

Syncope (fainting) Vaso/Vagal Syncope= transient loss of consciousness due to transient global cerebral hypoperfusion

Causes of Syncope: common

Vaso-Vagal

Hypoxia

Hypoglycemia

Epilepsy

Anxiety

Causes of Syncope: HEART

H = Heart Attack (MI)

E = Embolism (PE)

A = Aortic Stenosis / Acute Coronary Syndrome

R = Rhythm abnormalities (AFib)

T = Tachycardia

Unconsciousness continued.....

- Hypertensive Crisis
- Anaphylactic-CV Collapse
- CNS depressant overdose via drug ingestion
- Local anesthetic overdose
- Vestibular Basilar Insufficiency

Unconsciousness continued.....

- Gastric bleeding - hypovolemic challenge can see > increase Pulse with < drop BP
- Aortic Regurgitation
- Silent MI in females (no other signs or symptoms)
- Stroke, CVA (Brain Attack)

Unconsciousness continued…

associated with pain

- Subarachnoid Hemorrhage
- Aortic Dissection
- Abdominal Aortic Aneurysm
- Pulmonary Embolism
- Ectopic Rupture

Loss of consciousness..

- lack of response to sensory stimuli

S.O.S.

Supine-HT/CL

Oxygen

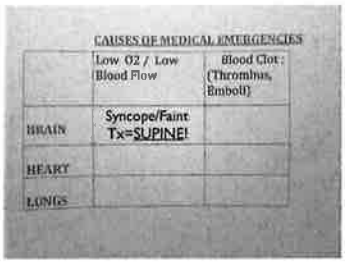
Spirits of Ammonia

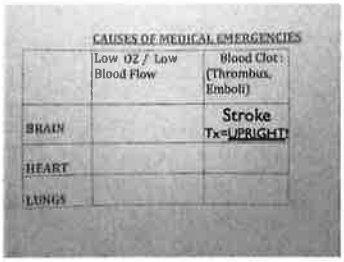
Position

- This is often the only treatment necessary for complete recovery
- Syncope = Supine--Head Tilt/Chin Lift
- When not managed correctly this can be the **only reason for a fatal outcome**
- S

Syncope and Stroke

With these two medical emergencies--
POSITION is everything!





SOSSOS

Supine
Oxygen
Spirits of ammonia
SUGAR
Oxygen
Stabilize

If Loss of Consciousness is > 15 - 20 seconds then ...

Spirits of Ammonia
if no response then ...

Consider: HYPOGLYCEMIA followed by an ARRHYTHMIA or a STROKE, A.I., ANEMIA, If there is no breathing or Pulse?=UNRESPONSIVE=R/O Cardiac Arrest then....911-CPR-AED

ACTIVATE EMS 911

Causes of Seizures:

Thinking caps on

- Stress - Epileptic history, low seizure threshold (new environment, new people)
- Cerebral Hypoxia (Iatrogenically induced)... from syncope + inadequate airway = not placing patient supine and not performing Head/Tilt, Chin/lift-(eg. allowing patient to dictate protocol)

Causes of Seizures

not from Epilepsy..

- Cerebral Hypoxia
- Hypoglycemia-if untreated - Glucogon-BSS
- Hyperventilation-if treated with what?, should be given CO_2 expired air.
- Local Anesthetic Overdose-shaking after local administration - Mild

What is **Mullers** Sign?

- What does it indicate? (#2)

Pulsating uvula

- Aortic regurgitation or aortic insufficiency

"The Three People you will meet in a

Panic Person - deer in the headlights: they are clueless.. and ask "Why is this happening to me, then may scream and run away

Silent Observer - hand over open mouth: they are frozen in time

Expert Advisor - does not lift a finger to help but always knows what to do and

Signs and Symptoms of <u>Hypoglycemia</u>:

sweating
confusion-disorientation
cold moist skin
shaking-tremor
cannot reason with patient
headache
deer in the headlights

Hypoglycemia (Insulin Shock)

- Typically seen in a insulin dependent diabetic who <u>takes their insulin</u> in the AM and then rushes to the office as your first appointment...(Lost track of time, clock off) <u>PATIENT DID NOT EAT BREAKFAST</u>
- The scenario will be.....15 minutes to ONE HOUR LATER

- 1) If driving - possible accident (going the wrong way on a highway)
- 2) If in the waiting room- front desk to be aware of signs and symptoms
- 3) If in the treatment room (Julia Roberts)

Insulin shock-continued... what happens in:

15 min=Rapid acting
30 min=Short acting
1-2 hours=Intermediate and Long acting

Insulin shock-continued... what happens <u>one</u> hour later...

- 1) If driving- possible accident (possibly going the wrong way on a highway)

Rembering.....

Who later became the father of.....

Treatment for Hypoglycemia

- <u>Sugar drinks</u>...O.J. (usually first choice), then <u>soft drinks (not diet)</u>, fruit juices, and candy - one exception- if on **Alpha-glucosidase inhibitors***
- You may have to force the patient to drink this- but only while conscious!
- If patient is <u>going to altered consciousness; (but not LOC)</u> can use cake frosting in a tube or <u>Insta-Glucose</u> can be applied to inner lips--this will be absorbed through the mucosa

*Precose and Glyset

8 Classes of Oral Meds for Diabetes

Alpha-glucosidase inhibitors: blocks the action of alpha-glucosidase which breaks down carbs like starches and Sucrose to Glucose. *Acarbose* (**Precose**) and *Miglitol* (**Glyset**). This slows down digestion and so glucose passes into the bloodstream slowly and blood glucose levels stay lower after a meal. Side effect is abdominal discomfort from the undigested carbs. Often combined with other meds that can cause hypoglycemia and ***If give sucrose to correct that - will have little effect. So give Glucose (Dextrose) or can also give Fructose (Fruit Juice) or Lactose (Milk)***

If Hypoglycemia develops from other meds when patient's taking **Alpha-glucosidase inhibitors**

When taking this medicine, low blood sugar can be treated with quick-sugar foods **except** table sugar or candy, *<u>which will not work!</u>*

OK with

Glucose = Dextrose

Lactose

Fructose

Treatment of Hypoglycemia:

15 gm's of Carb = 4-6 oz of fruit juice O.J. or Glucose or non-diet Soda - repeat in 4 min's

15 gm's = 3-4 teaspoons of Sugar*, 5 pieces of candy*

Good for short term not for long term and should consider complex carb like crackers and peanut butter (check not allergic!)

Also with a Glucometer check BS before leaving office! - especially if driving a car.

***Precose** and **Glyset**

- **If fully recovered from hypoglycemia-- continue with treatment if you AND the patient are comfortable.**
- **Patient can go home, if they are fully recovered from hypoglycemia* * How does this compare to Syncope?**
- **If in doubt.....?**

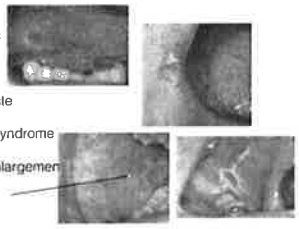
IOS = Index of Suspicion

Oral Manifestations..

1) Periodontal Disease
2) Increased risk of Infections
3) Salivary Gland Dysfunction: Hypo-salivation
4) Geographic Tongue
5) Benign Migratory Glossitis
6) Fissured Tongue

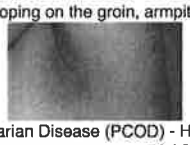
Oral Manifestations..

8) Traumatic Ulcers
9) Angular Cheilitis
10) Alterations in Taste
11) Burning Mouth Syndrome
12) Parotid Gland Enlargement
13) Lichen Plannus



Insulin Resistance

Acanthosis Nigricans - can develop in individuals with insulin resistance. The condition is marked by dark, patches developing on the groin, armpits, and back of neck.



Polycystic Ovarian Disease (PCOD) - High levels of insulin can worsen the symptoms of PCOS: Pelvic pain, deep voice, hair loss, weight gain

Insulin Resistance

Scleroderma Diabeticorum - can develop in individuals with insulin resistance. The condition is marked by a rash developing on the upper back, shoulders or neck area.

Hyperventilation

- Causes: High Anxiety**-Loss of CO_2=Respiratory Alkalosis
- Signs and Symptoms:
  Rapid shallow breathing,
  Confusion,
  Vertigo,
  Cold and numb hands

DO NOT GIVE O_2 !!

Treatment of Hyperventilation

-position patient upright
-calm and reassure patient
-breathe CO_2 enriched air-
Cup Hands-nose/mouth
-Do not give O_2!

Asthma:

8 % of US Population with 50% having an episode within the last year

Asthma:

Inflammatory response

Contraction of the smooth muscle of the bronchioles (broncho-constriction and bronchospasm)

Edema of the bronchial lining

Increased secretion of mucous

Asthma: abrupt onset of:

Shortness of Breath (SOB)

Wheezing

Coughing

Signs and Symptoms of an Asthmatic Attack

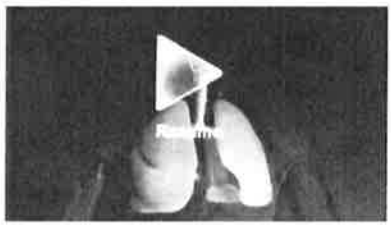
- patient breaths in short gasping inspirations
- expirations are long and wheezing...Why?
- sweating(diaphoresis)
- flushing of the skin
- Patient sits up--increased anxiety-
- tachypenia

Asthma:

Progression can lead to hypoxia and

Death

Asthma attack demo:



All offices must have:

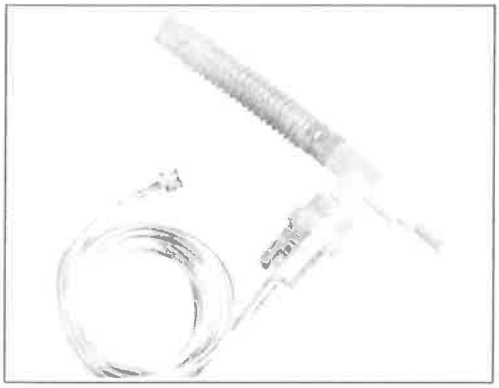
- ALBUTEROL=Ventolin or Proventil this is a non selective B_2 agonist, which may increase heart rate
- New brand is "Pro-Air"

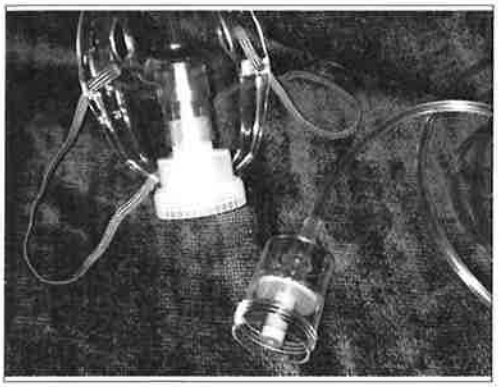
Treatment of Bronchospasm(Asthma)

- 1) Comfortable position-usually sitting up
- 2) 100% Oxygen
- 3) Use of inhaler (bronchodilator)-2X
- 4) Call EMS if 2 doses does not relieve spasm or if there is no prior history of asthma--R/O Anaphylactic reaction..
- 5) If condition worsens EMS-Epi 0.3mg of 1/1000

Asthma

AeroChamber Plus vs. Nebulizer





Epi pen

- Epi Pen delivers
  0.3mg. of 1:1000 Epi solution in (0.3ml.)
  Over 66 lbs.
- The Epi Pen Junior delivers
  0.15mg. of 1:2000 Epi solution in (0.3ml.)
  Between 33lbs. - 66lbs.

- EpiPen 2-PAK has 2 doses and a Trainer

Allergy = hypersensitive state caused by exposure to an Allergen, re-exposure to which causes a heightened capacity to react.

Allergies

30% of American claim to be allergic to something.

Mild Allergic Reaction:

- Skin: hives, rash and edema can progress. The faster the progression occurs the worse it will get

Mild Allergic Reaction:

- Must check throat and lips, sound of voice and lung sounds, while looking and listening a BP cuff is placed on the arm! CALMLY!!
- patients ability to talk is critical-engage in conversation..throughout episode...

Likely office allergins..

- Latex
- Antibiotics
- Aspirin
- Flavoring in the topical
- Acrylic liquids

DELAYED REACTION (60 minutes after exposure to allergin)

- LOCAL REACTION: Slow progression- Hives, Itching, Rash and Flushed skin
  This is not life threatening---treatment is PO (liquid) Benadryl 50mg. 3X day x 3 days..

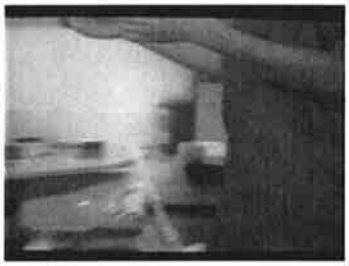
VS.

- If progressing quickly-and spreading, or the patient is very uncomfortable then give IM Benadryl-50mg-(1.0 ml) into the Deltoid Muscle

- If the onset of the skin reaction is rapid-but no Respiratory or CV involvement--treatment will be 50 mg IM Benadryl--plus 100% O_2 and immediate taking of vital signs.....Epi-ready! The key work is "rapid"

- Rapid onset= 911, IM Benadryl / Epi ready

Deltoid muscle



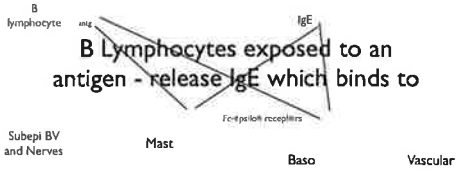
IM Distribution

GREEN

- severe allergic reaction

Anaphylaxis

the sooner you deliver EPINEPHRINE the sooner the patient will recover and survive!!



B Lymphocytes exposed to an antigen - release IgE which binds to

Both Mast Cells and Basophils produce: inflammatory Cytokines = Prostaglandins, Leukotrienes and Platelet-activating factor from Interleukins 1,4,6.

Mast Cells release vasoactive amines = Histamine = vasodilation and increased vascular permeability

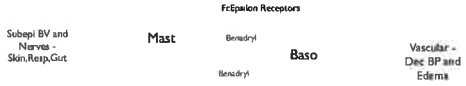
B Lymphocytes exposed to an antigen - release IgE which binds to

Epi will reverse the dec BP and Edema via its Alpha 1 and Beta 1receptors - BP, CO + HR

Epi will also reverse the Bronchospasm via its Beta 2

Benadryl = Diphenhyramine will bind to the FcEpsilon receptor to limit the Type I reax

B Lymphocytes exposed to an antigen - release IgE which binds to



Benadryl will cause increased secretions and if wheezing results administer:

Albuterol - a B2 Agonist

Anaphylaxis

You loose 1/3 to 1/2 the volume of your body to edema and therefore a severe lowering of BP

The effect of placing supine is equal to a 2 liter infusion of fluids

Careful use of Epi in LA for the following meds:

Meds to use

1) Epinephrine 0.3 mg to 0.5mg of a 1:1,000 solution IM
2) Diphenhydramine 50 mg IV/IM.
3) Albuterol Inhaler
If B blocker: e.g: Inderal=Propranolol
4) Glucogon IN
5) Methylprednisolone 125 mg IV = Solu-Medrol

Severe Allergic Reaction

Anaphylactic allergy

Systemic Reaction-Call 911-Get Epi

Cardio Vascular==Change in level of consciousness or--drop in BP-must have BP!

Respiratory==Change in breathing pattern--gasping on inspiration-laryngeal edema-(hands holding throat)

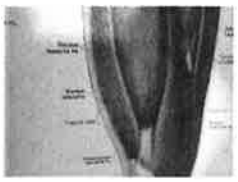
- You may already have: Lips swollen, eyes watery, nose running and Skin reaction..but not always!

- YOU! - GET THE EMERGENCY KIT-EPI

- These are all literally "IN YOUR FACE"
- -1)Skin--itching, wheels, bumps , erythema---
- -2)Watery Eyes, Running Nose, Swollen Lips

- The usual progression continued
- -3)Respiratory-----Laryngeal edema--bronchospasm
- -4)Cardio-Vascular-collapse-low BP-bradycardia--leading to unconsciousness.

YOU MUST BE ASSERTIVE!
in an ANAPHYLACTIC REAX
If you use Epi - the patient may die, *However*
If you don't use Epi the patient
WILL DIE !



Vastus lateralis muscle

Distribution of Epi

Effects of Epi...

- Epi directly increases Heart Rate via its binding to (B_1) receptors in the heart - increasing Cardiac Output
- Epi=acts on...Smooth muscle relaxation in the airways (B_2), and Pupillary -ciliary muscle relax for far vision and dilation of pupil
- Epi=causes contraction in the peripheral smooth muscle that lines most arterioles (A_1)-resulting in increasing Blood Pressure

Treatment for Anaphylaxis

- If respiratory distress-position upright
- If Cardiovascular distress(low BP) (LOC) position supine—
- 100% Oxygen to start
- Epi 0.3mg of 1:1000 adult (up to 0.5mg)
- TREATMENT- Benadryl as soon as possible after Epi as Benadryl works by competitively inhibiting H1 (histamine) receptors, and does not remove histamine that is already bound to the H1 receptors. Therefore administration should be early. Use as soon as itching and hives are significant

Treatment for Anaphylaxis

- EPI -To be used every 5 minutes—
- *BUT—administer ONLY after signs of respiratory depression. Epi does not work to reverse binding of histamine. It does act on A1,B1 and B2. Therefore it treats the symptoms not the progression of histamine. It has a short half life so use it when there is airway compromise. This is when you see: laryngeal edema, hoarse voice, wheezing and again in 5-7 minutes.*
- Consider inhaler (Albuterol) or in Nebuliizer if conscious especially after use of Benadryl.
- Solu-medrol can also be used for long term.

Careful use of Epi in LA for the following meds:

	BETA-ADRENERGIC BLOCKERS	Sympathomimetics epinephrine
OK	(a) Cardioselective	
	acebutolol	Monitan Rhotral Sectral
	atenolol	Tenormin
	metoprolol	Betaloc Lopressor
Caution	(b) Non-cardioselective	
	nadolol	Corgard
	oxprenolol	Trasicor
	pindolol	Visken
	propranolol	Inderal
	sotalol	Sotacor
	timolol	Blocadren Timoptic
OK	(c) Non-cardioselective and alpha blocker	
	labetalol	Trandate

Meds to use

1) Epinephrine 0.3 mg to 0.5mg of a 1:1,000 solution IM
2) Diphenhydramine 50 mg IV/ IM
3) Albuterol Inhaler
4) If on B-Blockers: Glucogon IN
5) Methylprednisolone 125 mg IV = Solu-Medrol

Stroke Assessment

Cincinnati Stroke Scale...used in ER

Simple scale for office use...(FAST)

F) Facial Drooping

A) Arm drift

S) Slurred Speech

T) Time is CRITICAL = call 911!!

FAST (If one of the 3 = 72% Stroke, if all 3 present = 85% Stroke)

Stroke continued:

- ISCHEMIC:
- Thrombotic Ischemic Stroke (Clot in a major BV)
- Embolic Ischemic Stroke (Piece of a clot or plaque lodges in a smaller BV to the brain) The Embolic Stroke is primarily caused by Atrial Fibrillation. 1/3 of people with AF will have a Stroke. (use of Motrin>15 days)

Stroke continued:

- HEMORRHAGIC STROKE: Blood is
- Deep within the Brain: Intracerebral Hemorrhage (Tear) or
- Between the brain and the Skull: (frequently caused by an ruptured aneurysm) Subarachnoid hemorrhage = SAH

Stroke continued: TIA

- = Short Stroke lasting up to 20 minutes with no permanent brain damage.
- 13% of people who have a TIA die within 1 year.
- Temporary blockage caused by a smaller blood clot in a smaller BV

Stroke continued: TIA

- May precede a full blown stroke - therefore must be at the hospital with potential to administer t-PA = **Tissue Plasminogen Activator** within 1- 4 hours to increase survival and full recovery however-
- 50% of people with a TIA never report it!
- CT may take up to 6-24 hrs to identify a Hemorrhagic Etiology to the Stroke - BUT:

Newest MRI for Diagnosis

Regular - MRI - Ischemic 6-12 hrs
CT - Hemorrhage - 6-24 hrs

New - Diffusion-weighted MRI (DTI)

New - Perfusion-weighted MRI

New - MRA = Angiography, without dye

These can determine location and degree and type of stroke within 1-2 hours

Myocardial Infarction

Partial or complete occlusion of a coronary vessel resulting in infarction of the tissue distal to that blockage

INFARCTION=Irreversible myocardial coagulation necrosis-occurs in just 4 hours!..but the 1st hour is the most critical..Why?

Update on Myocardial Infarction (2017)

- Three major factors: 1) Hypertension 2) LDL type, 3) Inflammation.....

1) HTN - "Silent killer"-over time weakens elasticity of arterial vessels--developing TIGHT JUNCTIONS--areas to embed material like plaque, platelets, fibrin

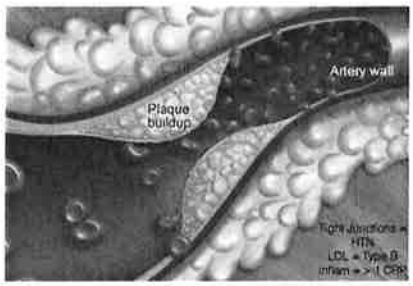
2) LDL - BAD cholesterol--pattern A and B Pattern A is large and buoyant = AOK, but Pattern B is small and dense = BAD

3) INFLAMMATION measured by (C-Reactive Protein) This is the final insult...

1 + 2 + 3 is the Disease(HTN),---Location(TIGHT JUNCTIONS),---Material (Recent Plaque, RBC's, Pattern B LDL) = Response (Walling off and sealing area with more RBC's and INFLAMMATORY mediators)--the result is fresh blood clots layered on the underlying plaque and inflammation .....

THESE BLOOD CLOTS CAN AND DO RUPTURE CAUSING MOST MI's and STROKES!!!!

It's a "123 Punch!"-must check BP, LDL, Lipo Pr a ,CRP!!



Unless an artery (including coronary arteries) is narrowed by at **least 75%**, the blood flow remains mostly unaffected!---Therefore--At 74%, you're OK and Asymptomatic

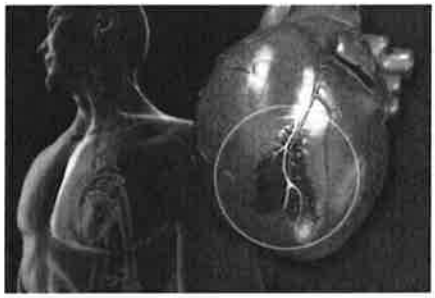
It's the new Plaque and fresh fibrin clot that's the problem.

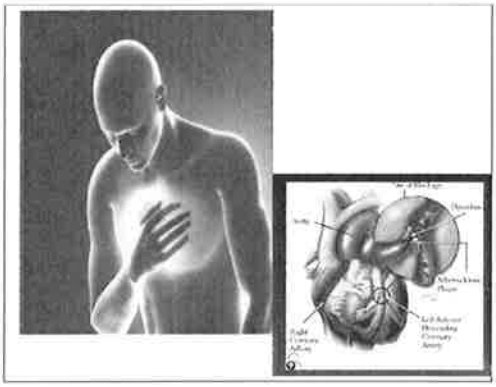
If your AM pulse (when you wake up) is over 90 you have a 3X higher risk of a Myocardial Infarction and heart disease,

If your AM pulse is under 60 you are unlikely to have cardiac disease.

Conclusion:

- Ask your doctor if you can go on a treadmill for a minimum of 10 minutes at 4.2 mph and set the incline to 4 and
- as long as you can do the above then you're as "**good as it gets**"





Cardiac events…

Average age for a Male with first Cardiac Event is 64.5

For a woman it is 70.3

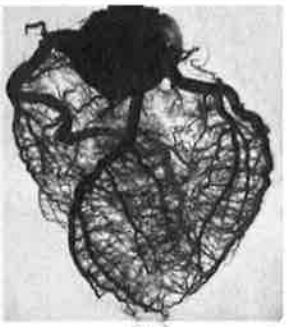
Women only…

- EXTREME FATIGUE -you cannot get up in the morning after a good night sleep….this can be up to one month before the CA.
- Transient loss of consciousness
- Belching - Indigestion

Women only…

- Pain between the shoulder blades usually on the left side
- 50% of the time - Silent MI - seen on an EKG as an inverted Q wave (maker of a previous MI).

Working harder (Physical Exercise) over the long term can increase vascularization



80+% Blockage

Myocardial Infarction	vs.	Anginal attack
Pain:	CRUSHING	vs.	heavy
Level:	SEVERE	vs.	moderate
Time:	CONTINUES	vs.	transient

not relieved by Nitro vs. relieved by Nitro-note: contraindicated if BP is under 90 Systolic and if patient took ED meds within last 48 hours, eg. Viagra, Cialis, etc.

Blink story--Goldman algo 96' CCH pentagon 75%-90% vs. 95% with-algo-"ST,Ang,CHF/JVD", now + Troponin T= >%

Never list

- never give Oxygen to a patient who is hyperventilating.
- never hesitate to give Epi to a patients in a Anaphylactic Reaction.
- Never give nitro if Systolic BP is < 90.
- Never give nitro to a patient who took Viagra within the last 48 hours.

- Never place a patient upright who is in syncope------WHY?
- Never place a patient supine who is having a suspected Stroke——WHY?
  - Never give aspirin to a patient with a suspected stroke
- These are Shout out answers....

- do not schedule a cardiac patient as the first patient on a *Monday Morning*

Causes of Seizures

not from Epilepsy

- Give Three

Causes of Seizures

not from Epilepsy..

- Cerebral Hypoxia - inadequate airway - eg. trauma, sleep apnea - tx- position
- Hypoglycemia - if untreated- and LOC Glucogon-BSS
- Hyperventilation - if treated with Oxygen - should treat with CO_2
- Local Anesthetic Overdose-shaking after local administration

List 4 emergencies that can occur, just by looking at this....

OK, how about 3...

- 1) Angina patient Angina attack
- 2) Asthma patient Asthmatic attack
- 3) Young Healthy Patient Syncope
- 4) Young Healthy Patient Hyperventilation
- 5) Epileptic patients Seizures
- 6) HTN patients Hypertensive Crisis

Final Daily Doubles

Oxygen as Premedication When? 5 Situations?

Oxygen as Premedication When? 4 Situations?

Oxygen as Premedication

Any Patient with Angina

If the RPP is over 12,000

Oxygen Saturation is below 93%

Patients with a history of seizures not responsive to meds

Oxygen as Premedication

Asthma and treated with Steroids and Anticholinergic meds

History of CHF + JVD + Exertional Dyspnea

Macho Man 16-30 years old - first visit for an extraction

History of an MI in the past 6 months

- DPompaOMS@gmail.com

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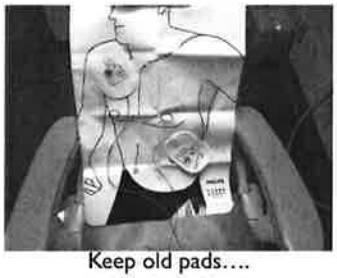
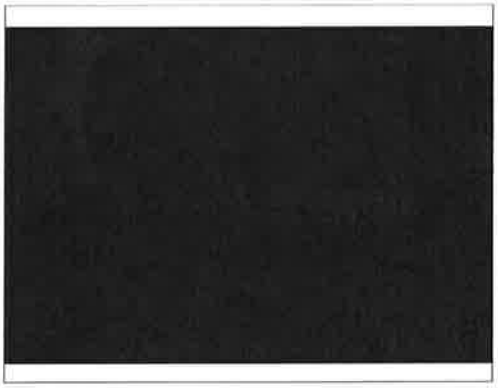
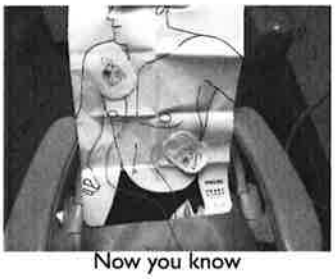


Keep old pads....





Now you know

The End

Thank you!

- Please fill out the evaluation form and include any comments you may like to add.

- DPompaOMS@gmail.com

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