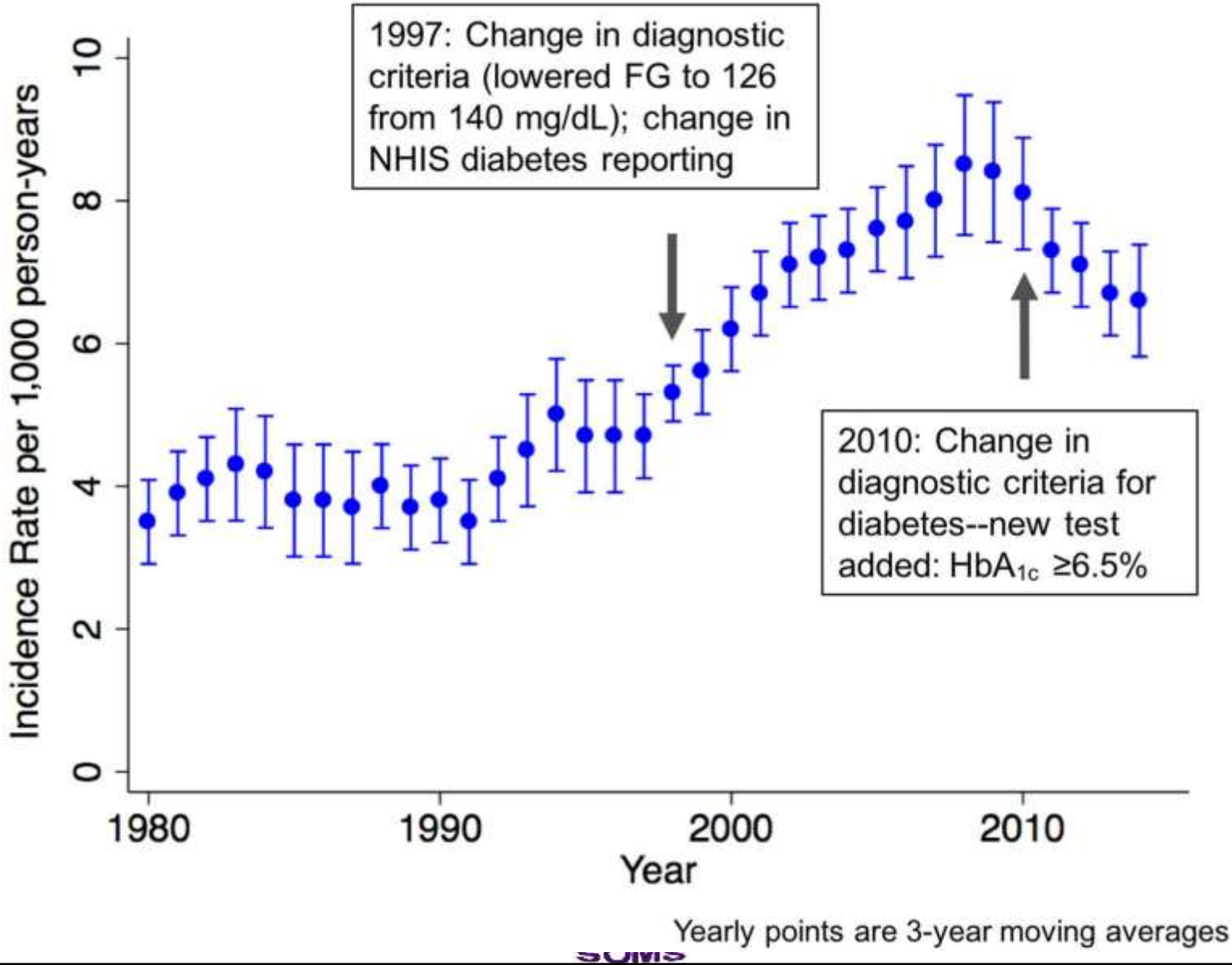
Medical Emergencies Update 2019 – Part II

Altered Consciousness

Altered Consciousness

Diabetic Emergencies

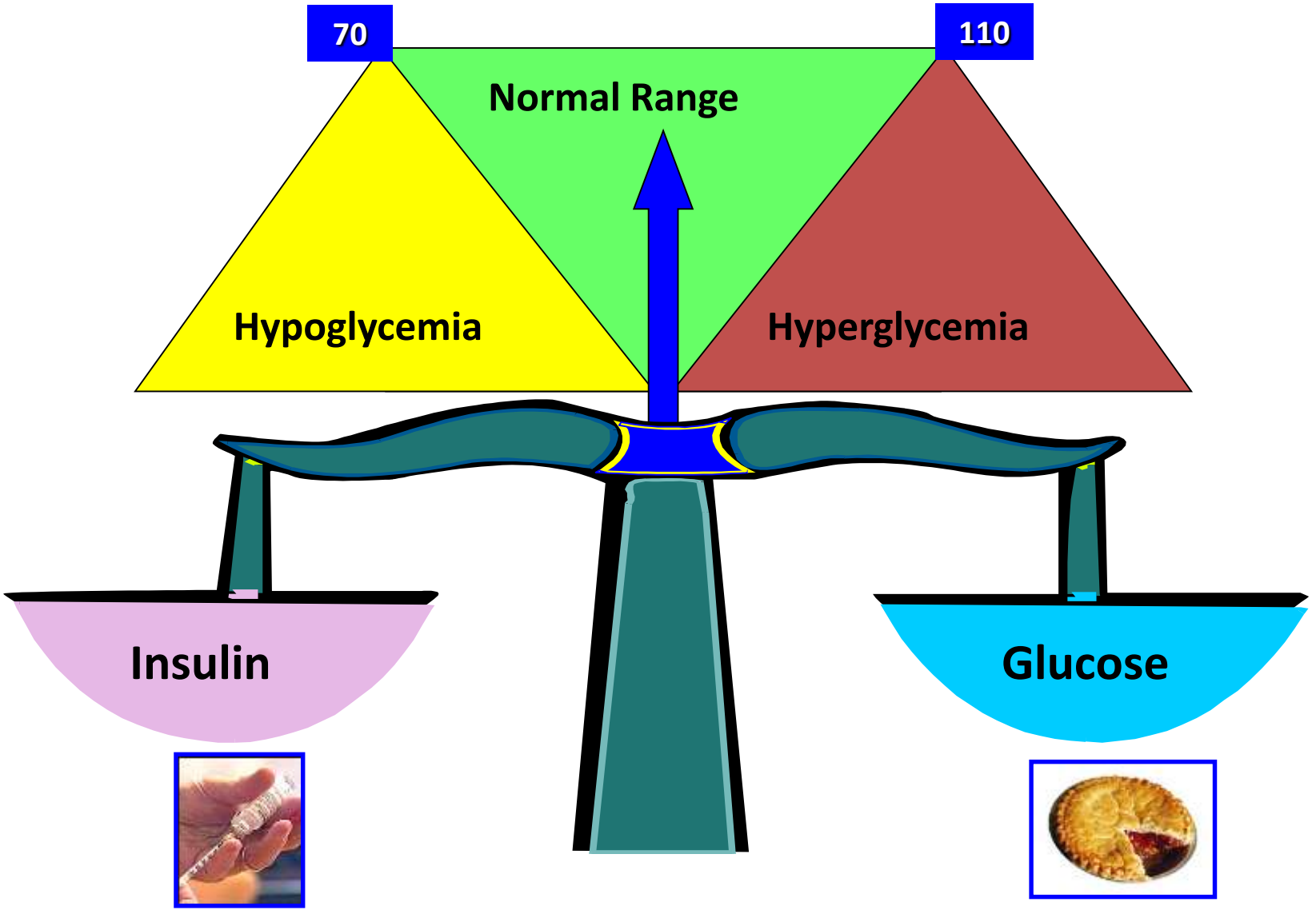
U.S. Diabetes Epidemic



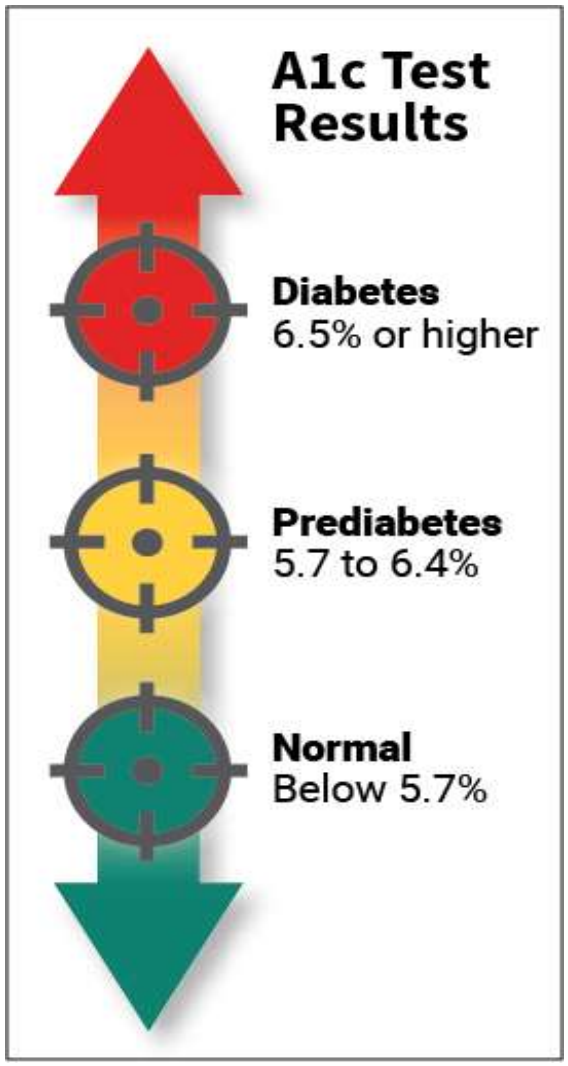
Diabetes Classification

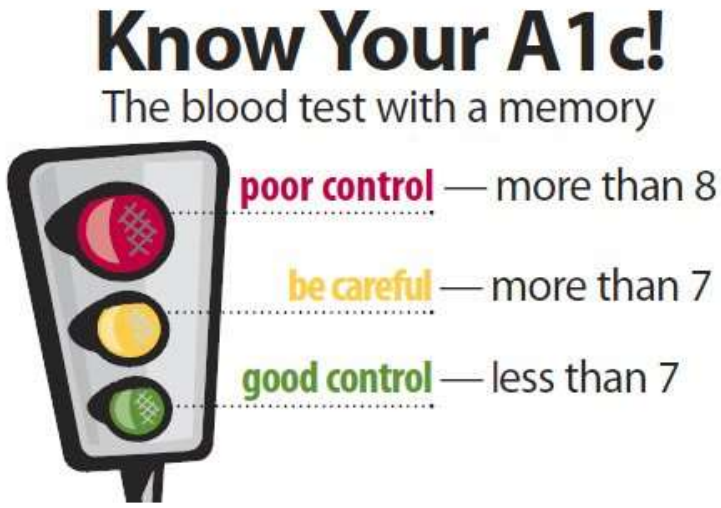
- ✓ **Type 1**
  - **Absolute insulin deficiency, usually autoimmune process – 8%**
- ✓ **Type 2**
  - **Insulin resistant with relative deficiency – 90%**

Diabetes CBG Issues



Diabetes Control – HbA_{1c}





LONG TERM CONTROL

Doesn't reflect risk of hypoglycemia

Diabetic Emergencies

Dental Management to Avoid Problems

Morning appointments are best

Confirm took insulin and ate <u>usual</u> meal

What is their CBG – Check with glucometer

Diabetic Emergencies

Dental Management to Avoid Problems

CBG = Capillary Blood Glucose

What is their glycemic control NOW ?

Timing	Target in mg/dl
Fasting	70- 90 mg/dl
Pre-meal	90-100 mg/dl
1 hr after a meal	<130 mg/dl
2 hrs after a meal	<120 mg/dl

Target for dental tx: >70mg/dL and < 200mg/dL

Diabetic Emergencies – Altered LOC

Insulin Shock (Hypoglycemia)

There is too much insulin, causing a lack of sugar in the blood.

Some causes are:

- Not enough food
- Too much insulin
- Excessive exercise

Insulin facilitates the transport of sugar

Diabetic Coma (Hyperglycemia)

Hyperglycemia is a lack of insulin, this causes too much sugar in the blood and not enough in the cells

Causes:

- Too much food
- Not taken insulin

Insulin facilitates the transport of sugar

Diabetic Emergencies – Altered LOC

Insulin Shock (Hypoglycemia)

There is too much insulin, causing a lack of sugar in the blood.

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- Too much insulin
- Excessive exercise

Insulin facilitates the transport of sugar

CBG < 50mg/dL

Diabetic Coma (Hyperglycemia)

Hyperglycemia is a lack of insulin, this causes too much sugar in the blood and not enough in the cells

Causes:

- Too much food
- Not taken insulin

Insulin facilitates the transport of sugar

CBG > 300mg/dL

Diabetic Emergencies – Altered LOC

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Causes:

- Too much food
- Not taken insulin

Insulin facilitates the transport of sugar

CBG < 50mg/dL

CBG > 300mg/dL

Hypoglycemia

Cool, wet, pale

Confusion

Lethargy

Hunger

Hyperglycemia

Hot, flushed, dry

Acetone breath

Dry mouth

Irritable

Diabetic Emergencies – Altered LOC

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Causes:

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CBG < 50mg/dL

CBG > 300mg/dL

Insulin Shock (Hypoglycemia)

Signs and Symptoms…

- Normal breathing
- Decreased or altered level of consciousness
- Dizziness, headache
- Fainting
- Seizures
- Disorientation
- Coma

Diabetic Coma (Hyperglycemia)

Signs and Symptoms…

- Rapid deep breathing
- Decreased level of consciousness
- Dehydrated (dry), warm skin
- Sweet or fruity, (acetone) odor on breath
- Dry mouth and intense thirst
- Increasing restlessness, confusion

Diabetic Emergencies – Altered LOC

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Hyperglycemia is a lack of insulin, this causes too much sugar in the blood and not enough in the cells

Causes:

- Too much food
- Not taken insulin

Insulin facilitates the transport of sugar

CBG < 50mg/dL

CBG > 300mg/dL

Insulin Shock (Hypoglycemia)

Signs and Symptoms…

- Normal breathing
- Rapid, full pulse
- Decreased or altered level of consciousness
- Pale, moist skin (sweaty at times)
- Dizziness, headache
- Fainting
- Seizures
- Disorientation
- Coma

This onset of this condition is sudden, can occur within minutes

Diabetic Coma (Hyperglycemia)

Signs and Symptoms…

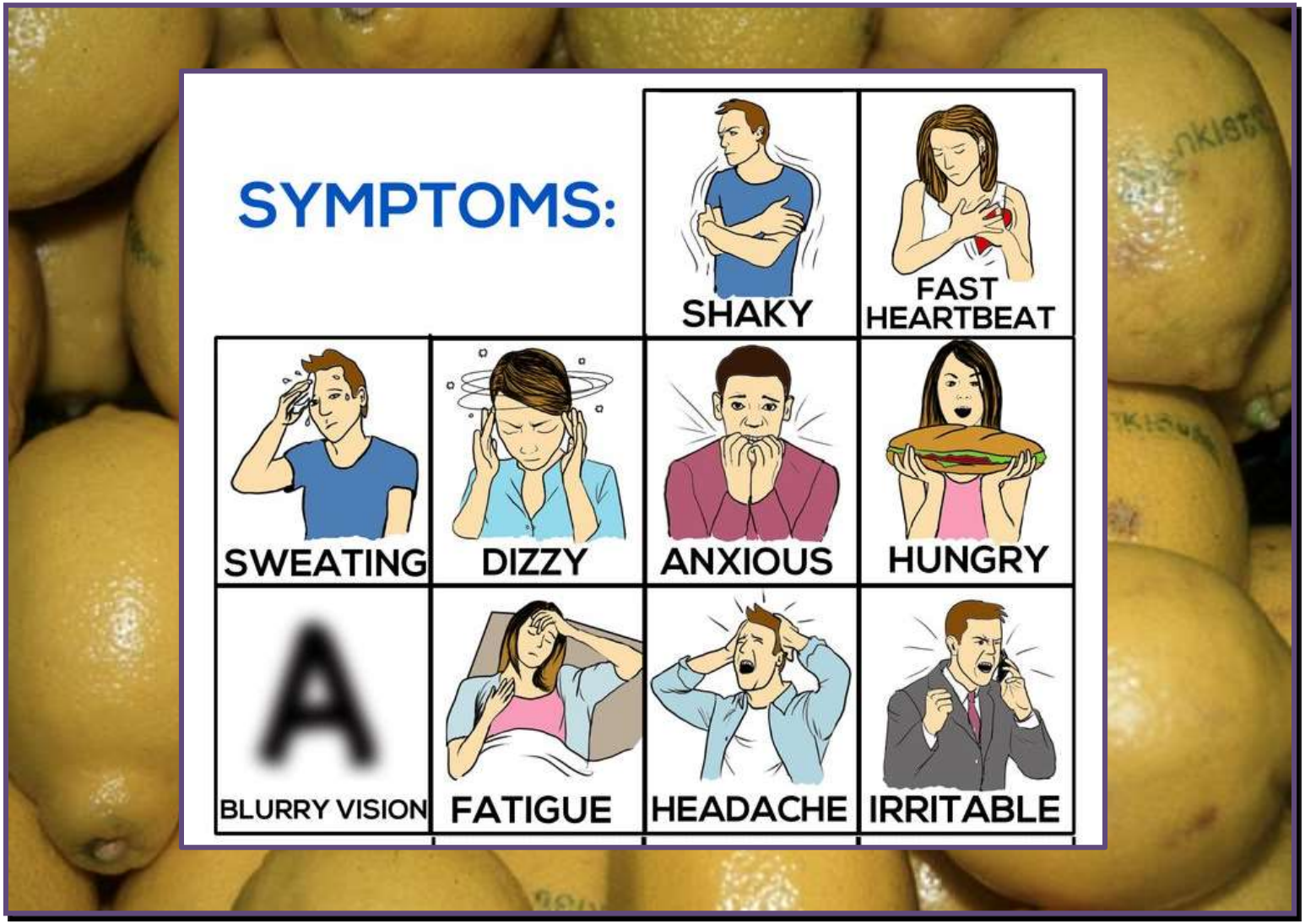
- Rapid deep breathing
- Rapid weak pulse
- Decreased level of consciousness
- Dehydrated (dry), warm skin
- Sweet or fruity, (acetone) odor on breath
- Dry mouth and intense thirst
- Increasing restlessness, confusion

This onset of this condition is gradual over a period of days

Insulin Shock (Hypoglycemia) => Rapid Onset

Preparation	Onset of effect	Peak	Activity duration (hours)
Rapid-acting insulins			
Insulin Lispro Insulin Aspart	10 – 20 minutes	30 – 60 minutes	3 – 5
Short-acting insulins			
Regular insulin	30 – 60 minutes	1 – 2 hours	5 – 7
Intermediate-acting			
NPH (Neutral protamine Hagedorn) Insulin Lente	1 – 2 hours	6 – 12 hours	18 – 24
Long-acting insulins			
Insulin Ultralente Insulin glargine	4 – 6 hours 1 – 2 hours	16 – 18 hours No peak	24 – 36 24

Diabetic Emergencies

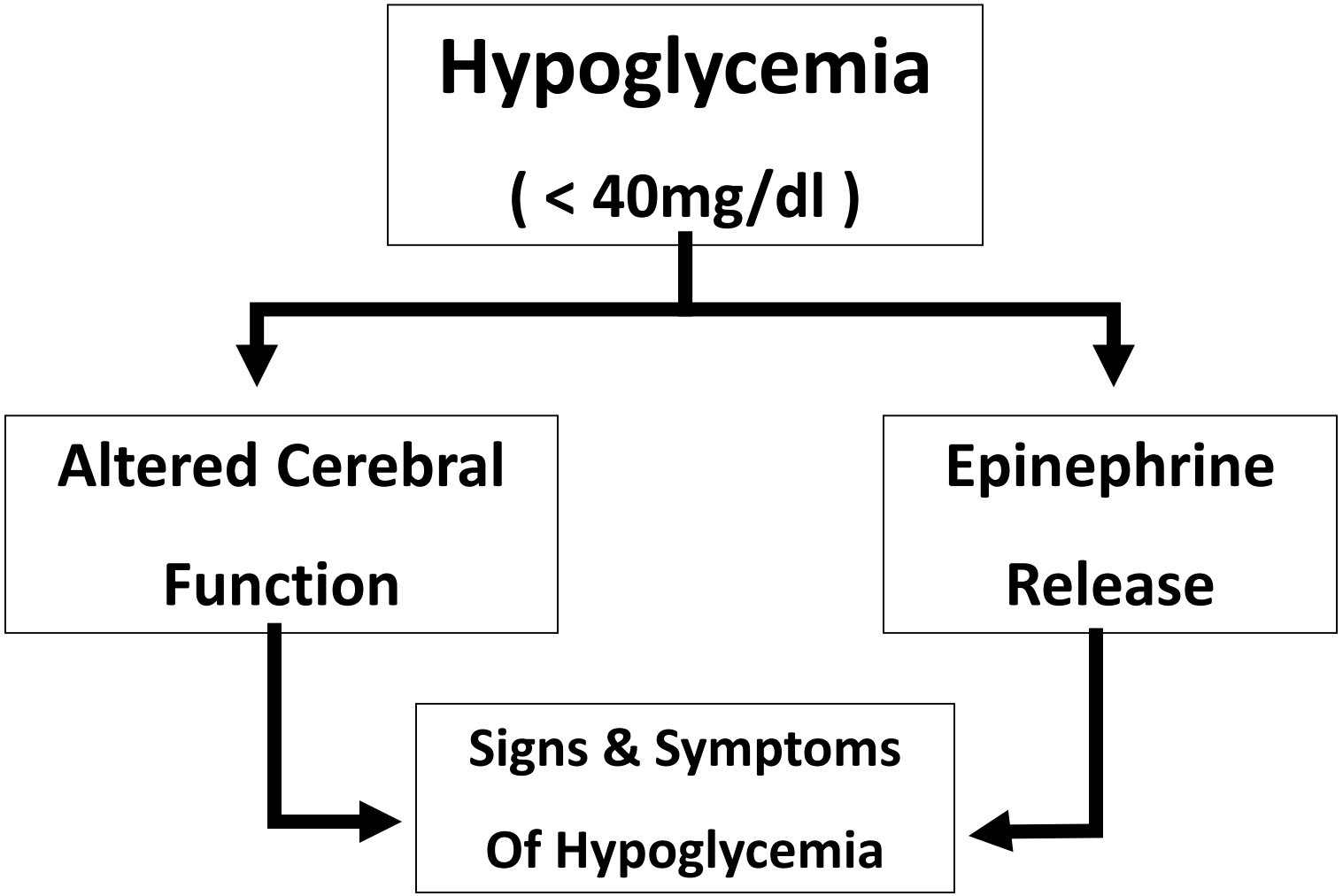


Diabetic Emergencies

Diabetic patients who behave in a bizarre manner or exhibit altered level of consciousness should be managed as if they are HYPOGLYCEMIC until proven otherwise.

Diabetic Emergencies

Hypoglycemia – Insulin Shock



Hypoglycemia – Insulin Shock

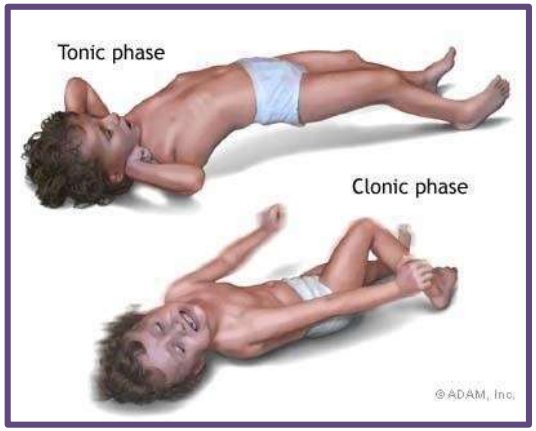
Hypoglycemia – Early manifestations

- **Diminished cerebral function**
  - **Alteration of mood**
  - **Lack of spontaneity**
- **Weakness, dizziness**
- **Pale, moist skin**
- **Headache**

Hypoglycemia – Insulin Shock

Hypoglycemia – Late manifestations

- ✓Sweating
- ✓Tachycardia
- ✓Hypotension
- ✓Anxiety
- ✓Seizure activity
- ✓Unconsciousness



Hypoglycemia Management

* * Conscious Patient * *

Position patient comfortably

C - A – B – BLS as needed

Administer oral carbohydrate (InstaGlucose)

(Episode terminates)

Observe one hour

Discharge patient, escort?

(Episode continues)

Activate EMS

Glucagon 1mg IM or IV

Dextrose 50% 50ml IV

Discharge or hospital ?

Hypoglycemia Management

* * Unconscious Patient * *

Position patient supine, legs elevated

⬇

C – A – B – BLS as needed

⬇

Activate EMS - ASAP

⬇

<u>Parenteral Carbohydrates</u>

Dextrose 50% 50ml IV

Glucagon 1mg IM or IV

(Epinephrine 0.5mg SQ or IM)

⬇

Oral carbohydrates after recovers

⬇

Discharge or transport to hospital

Altered Consciousness

Seizures

Seizure Disorders

Classifying Epilepsy and Seizures

Seizure types:

Partial

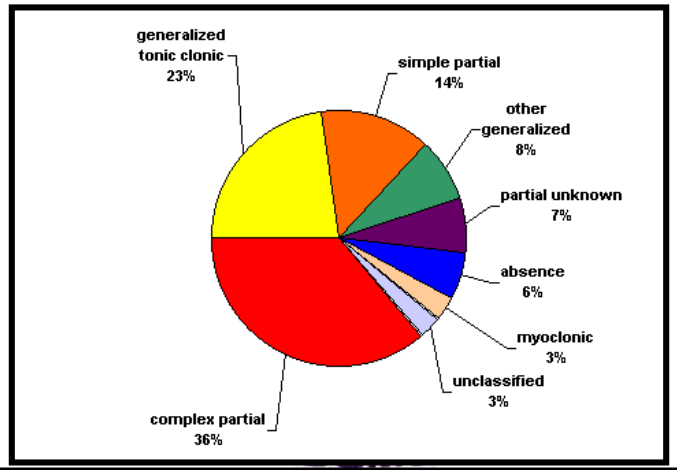
Simple → **Consciousness is maintained**

Complex → **Consciousness is lost or impaired**

Generalized

Absence → **Altered awareness**

Convulsive → **Characterized by muscle contractions with or without loss of consciousness**



Seizure Disorders

What do you do when you have your seizure?

Seizure Disorders

Questions to ask patient

How frequent are seizures? Last?

What precipitates seizures?

What type of seizure activity?

How long do seizures last?

How are you after seizure?

What medications do you take?

Seizure Disorders

Common triggering factors

Flashing lights

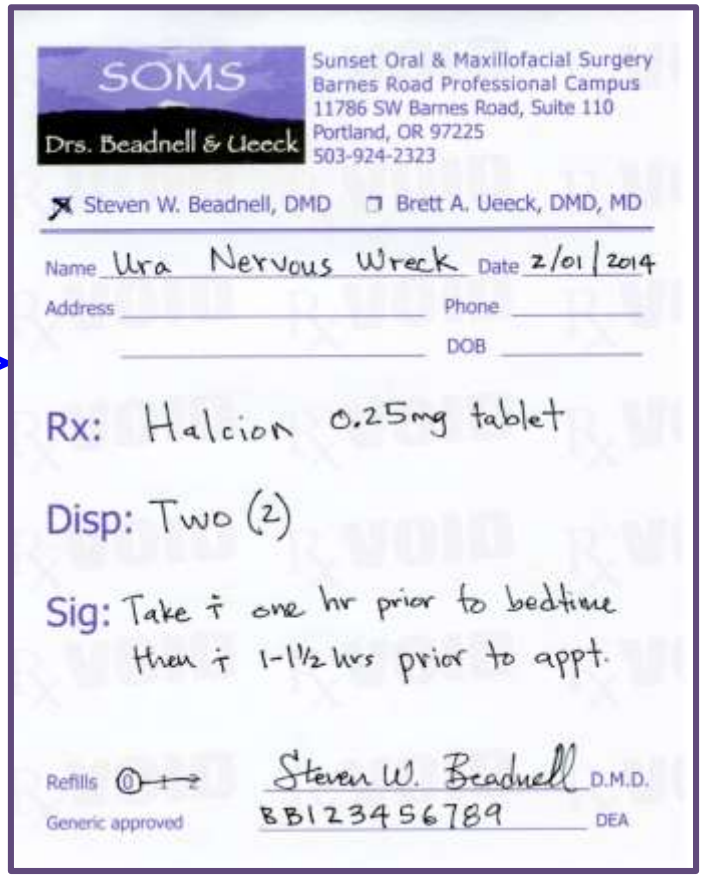
Fatigue, missed meal

Emotional stress

Alcohol ingestion

Physical stress

Hypoglycemia



SOMS
Drs. Beadnell & Ueeck

Sunset Oral & Maxillofacial Surgery
Barnes Road Professional Campus
11786 SW Barnes Road, Suite 110
Portland, OR 97225
503-924-2323

Steven W. Beadnell, DMD Brett A. Ueeck, DMD, MD

Name Ura Nervous Wreck Date 2/01/2014
Address Phone
DOB

Rx: Halcion 0.25mg tablet

Disp: Two (2)

Sig: Take 1 one hr prior to bedtime
Then 1 1-1½ hrs prior to appt.

Refills 0 1 2
Generic approved

Steven W. Beadnell D.M.D.
BB123456789 DEA

Seizure Disorders

Possible causes in dental office

Epilepsy

Local anes overdose

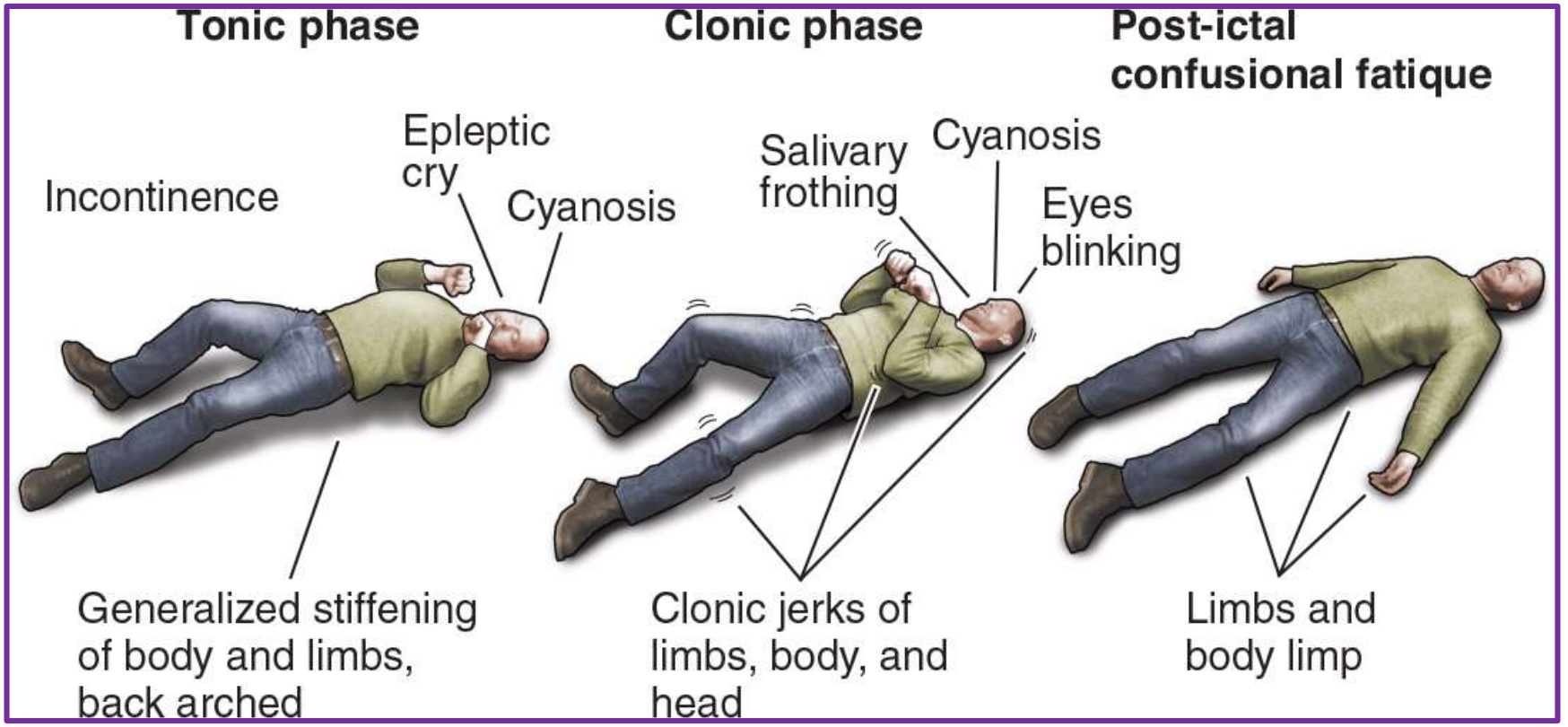
Hyperventilation

CVA (stroke)

Hypoglycemia

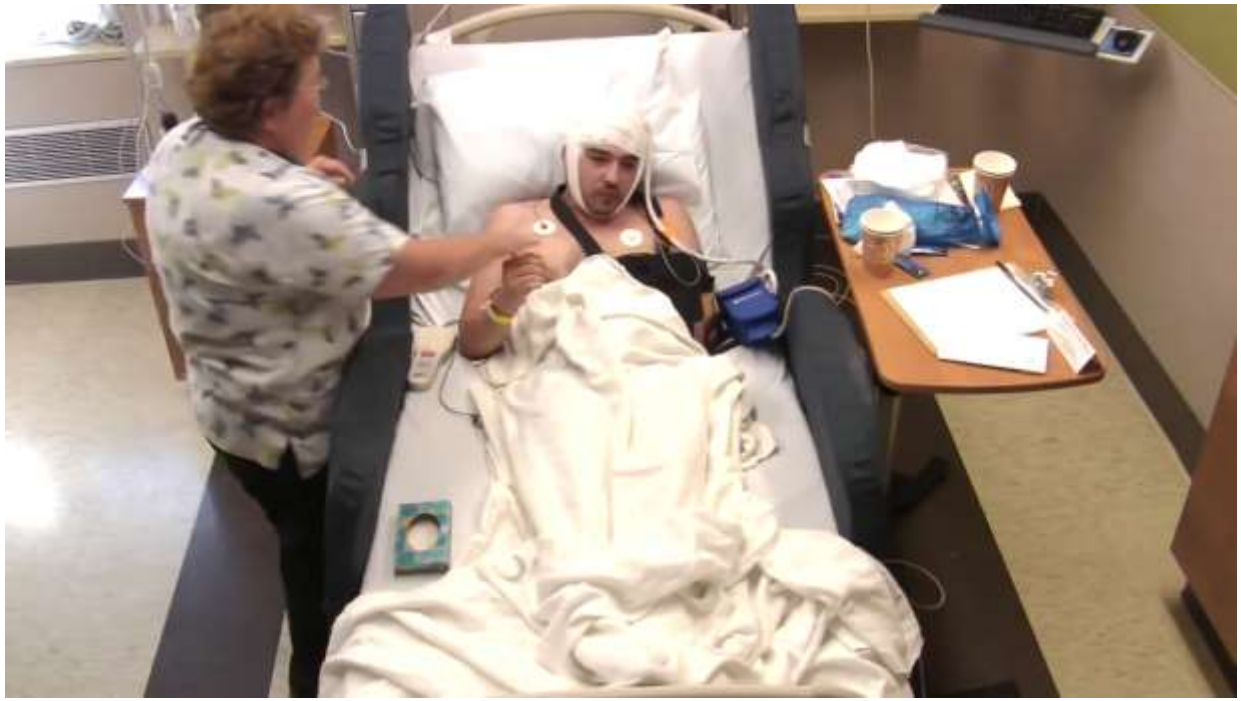
Syncope (hypoxia)

Grand Mal Seizure



Seizures will generally last 1 to 3 minutes. If a tonic-clonic seizure lasts longer than 5 minutes requires medical attention. A seizure that lasts longer than 10 minutes, or three seizures without a normal period in between indicates a dangerous condition called convulsive status epilepticus.

Grand Mal Seizure



GM Seizure Management

Ictal Phase

Position supine, legs slightly elevated

⬇

Activate EMS if new onset

⬇

C - A – B – BLS as needed

⬇

*** Protect from injury ***

Administer oxygen

Monitor vital signs

GM Seizure Management

Postictal Phase

Keep supine, legs slightly elevated

↓

C - A – B – BLS as needed

↓

Monitor vital signs

Reassure patient, permit recovery

↓

Discharge patient

To hospital | To home | To physician

Epinephrine Overdose Reaction

Vasoconstrictors in Local Anesthetics

Agent	Available concentrations	Maximum dose	Local anesthetics used with agent
Epinephrine	1:50,000	Healthy adult: 0.2 mg	Lidocaine 2%
	1:100,000	Patient with CVD and ASA 3,4: 0.04 mg	Lidocaine 2%
			Articaine 4%
	1:200,000		Articaine 4%
			Bupivacaine 0.5%
			Prilocaine 4%
Levonordefrin (Neo-Cobefrin)	1:20,000	Healthy adult: 1.0 mg Patient with CVD and ASA 3,4: 0.2 mg	Mepivacaine 2%

ASA, American Society of Anesthesiologists; CVD, cardiovascular disease.

Vasoconstrictors in Local Anesthetics

Dilution	Available drug	Dose (mg/mL)	mg/cartridge (1.8 mL)	Maximum no. of cartridges
1:1000	Epinephrine SC, IM Anaphylaxis	1.0	N/A	N/A
1:10,000	Epinephrine IV, ET Cardiac arrest	0.1	N/A	N/A
1:20,000	Levonordefrin	0.05	0.09	10 (H), 2 (C)
1:50,000	Epinephrine	0.02	0.036	5 (H), 1 (C)
1:80,000	Epinephrine	0.0125	0.0275 (2.2-mL cartridge)	10 (H), 2 (C)
1:100,000	Epinephrine	0.01	0.018	10 (H), 2 (C)
1:200,000	Epinephrine	0.005	0.009	10 (H),* 2 (C)
1:300,000	Epinephrine	0.0033	0.006	10 (H),* 4 (C)

C, cardiac patient; ET, endotracheal; H, healthy patient; IM, intramuscular; IV, intravenous; N/A, not applicable; SC, subcutaneous.
*Maximum number of cartridges determined by local anesthetic dose.

Clinical manifestations of EPI overdose

Signs:

- ✓ **Elevated blood pressure**
- ✓ **Elevated heart rate**

Symptoms:

- ✓ **Fear**
- ✓ **Anixety**
- ✓ **Tenseness**
- ✓ **Restlessness**
- ✓ **Tremor**
- ✓ **Perspiration**
- ✓ **Dizziness**
- ✓ **Weakness**
- ✓ **Respiratory difficulty**
- ✓ **Palpitations**

Clinical manifestations of EPI overdose

Recognize problem: anxiety, tremor, diaphoresis, headache, florid appearance, increased heart rate, elevated blood pressure

↓

Discontinue dental treatment

↓

P => Position patient comfortably

↓

C-A-B => Assess circulation, airway, breathing
Check vital signs

↓

Reassure the patient
Monitor vital signs
Administer supplemental oxygen
Permit patient to recover
Administer NTG for significant hypertension

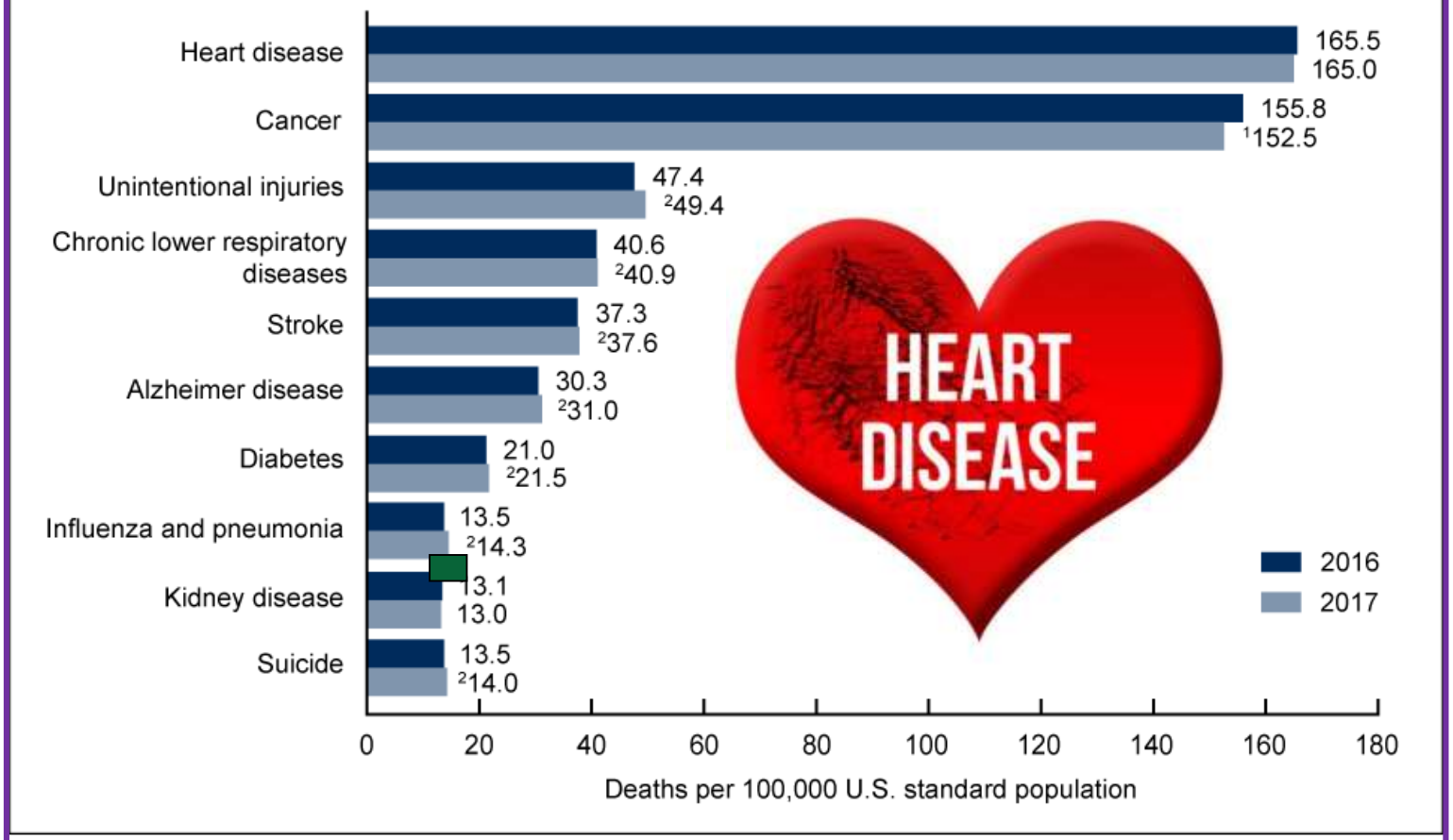
↓

Discharge patient

Cardiac Emergencies

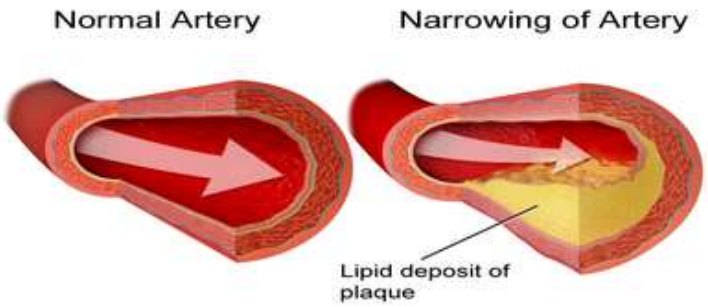
U.S. Leading Causes of Death 2017

Figure 4. Age-adjusted death rates for the 10 leading causes of death: United States, 2016 and 2017

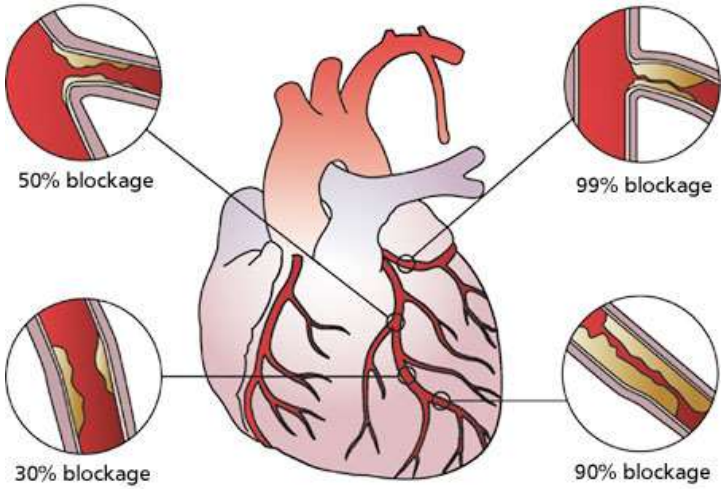


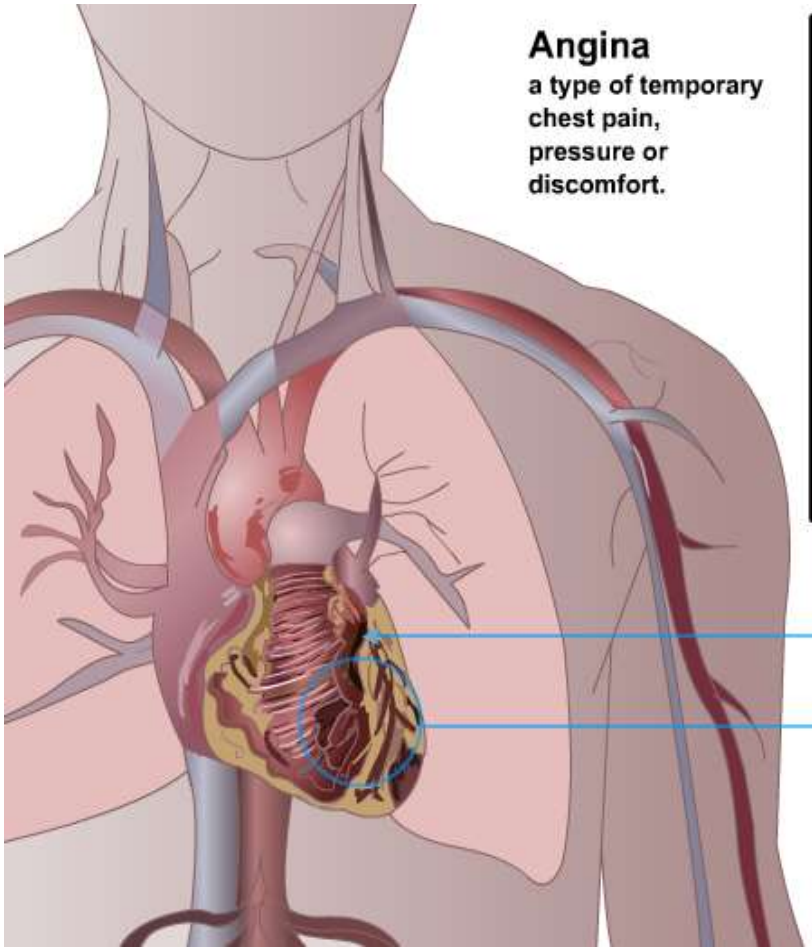
[1]Statistically significant decrease in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
[2]Statistically significant increase in age-adjusted death rate from 2016 to 2017 ($p < 0.05$).
NOTES: A total of 2,813,503 resident deaths were registered in the United States in 2017. The 10 leading causes accounted for 74.0% of all deaths in the United States in 2017. Causes of death are ranked according to number of deaths. Rankings for 2016 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db328_tables-508.pdf#4.
SOURCE: NCHS, National Vital Statistics System, Mortality.

Ischemic Heart Disease



Coronary Artery Disease

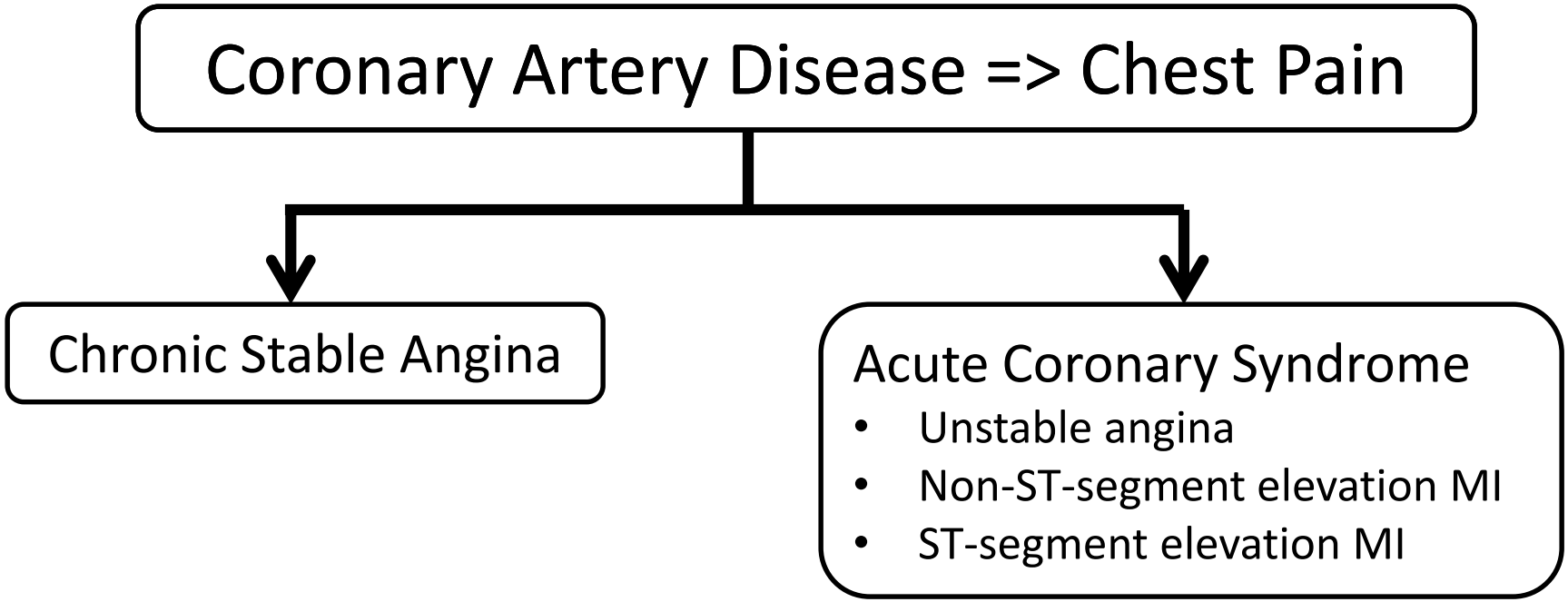




Ischemic Heart Disease

Coronary Artery Disease => Chest Pain

Ischemic Heart Disease

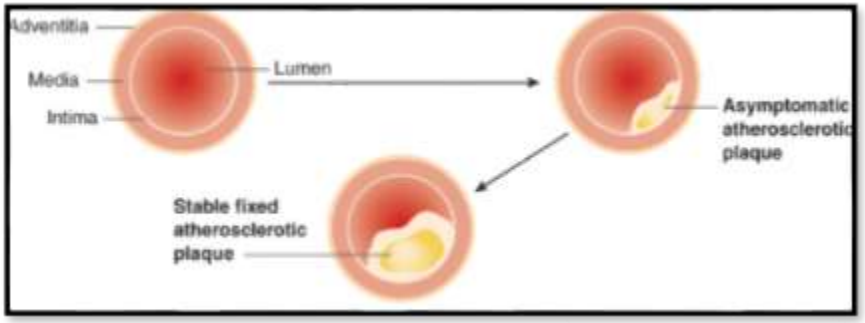


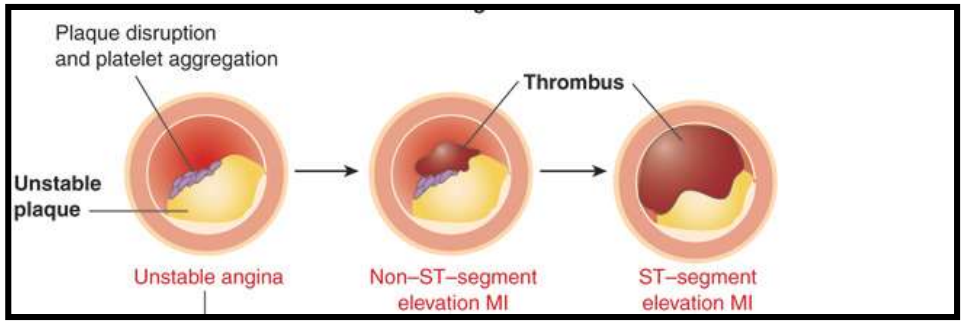
Ischemic Heart Disease

Pathophysiology is different

Chronic Stable Angina

Acute Coronary Syndrome
- Unstable angina
- Non-ST-segment elevation MI
- ST-segment elevation MI

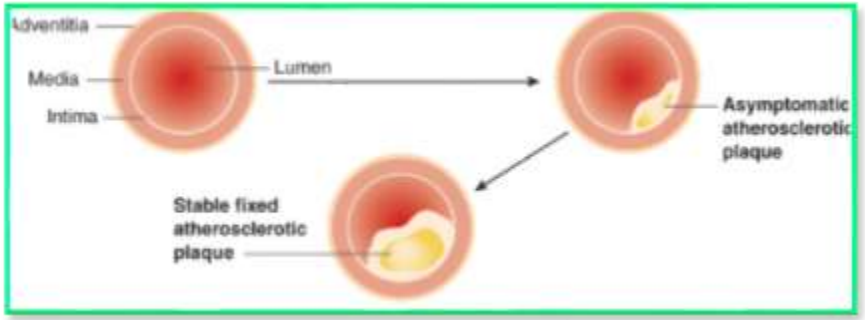




Ischemic Heart Disease

Coronary Artery Disease => Chest Pain

Chronic Stable Angina



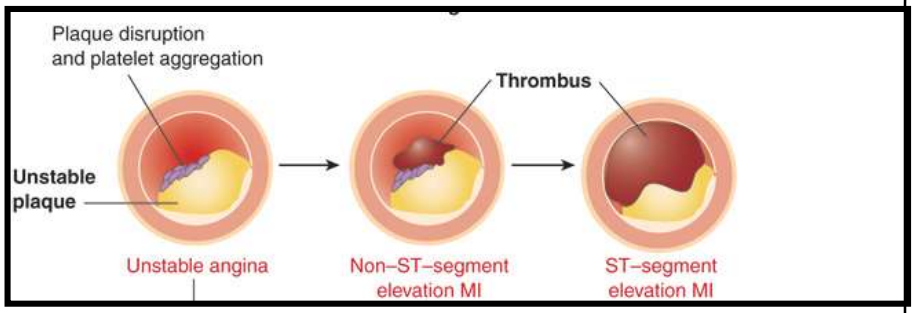
- Previously diagnosed, chronic
- Consistent factors precipitate
- Resting or same dose NTG relieves
- Consistent symptoms (no changes)
- Not associated with other symptoms
- Good relief with NTG
- Usually < 20 minutes

Ischemic Heart Disease

Coronary Artery Disease => Chest Pain

Acute Coronary Syndrome

- **Unstable angina**
- **Non-ST-segment elevation MI**
- **ST-segment elevation MI**

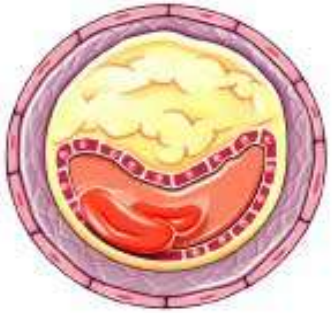


Unstable Angina **NSTEMI** **STEMI**

- **New onset**
- **Lower exertion threshold**
- **No or change in pattern of relief ,↑NTG**
- **New or different symptoms**
- **Associated symptoms:**
  - **Nausea, SOB, diaphoresis, weakness**
- **No or poor relief with NTG**
- **Usually > 20 minutes**

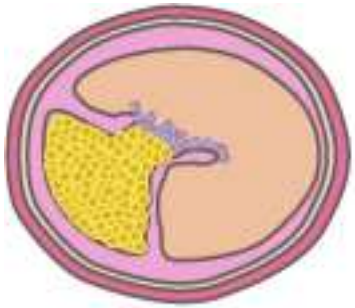
Pathophysiology Chronic Stable Angina vs ACS

Chronic Stable Angina

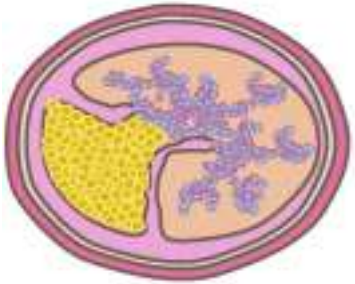


Stable angina: plaque formation

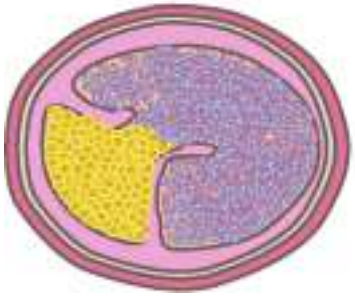
Acute Coronary Syndrome



Unstable angina: platelet adhesion



NSTEMI: platelet aggregation



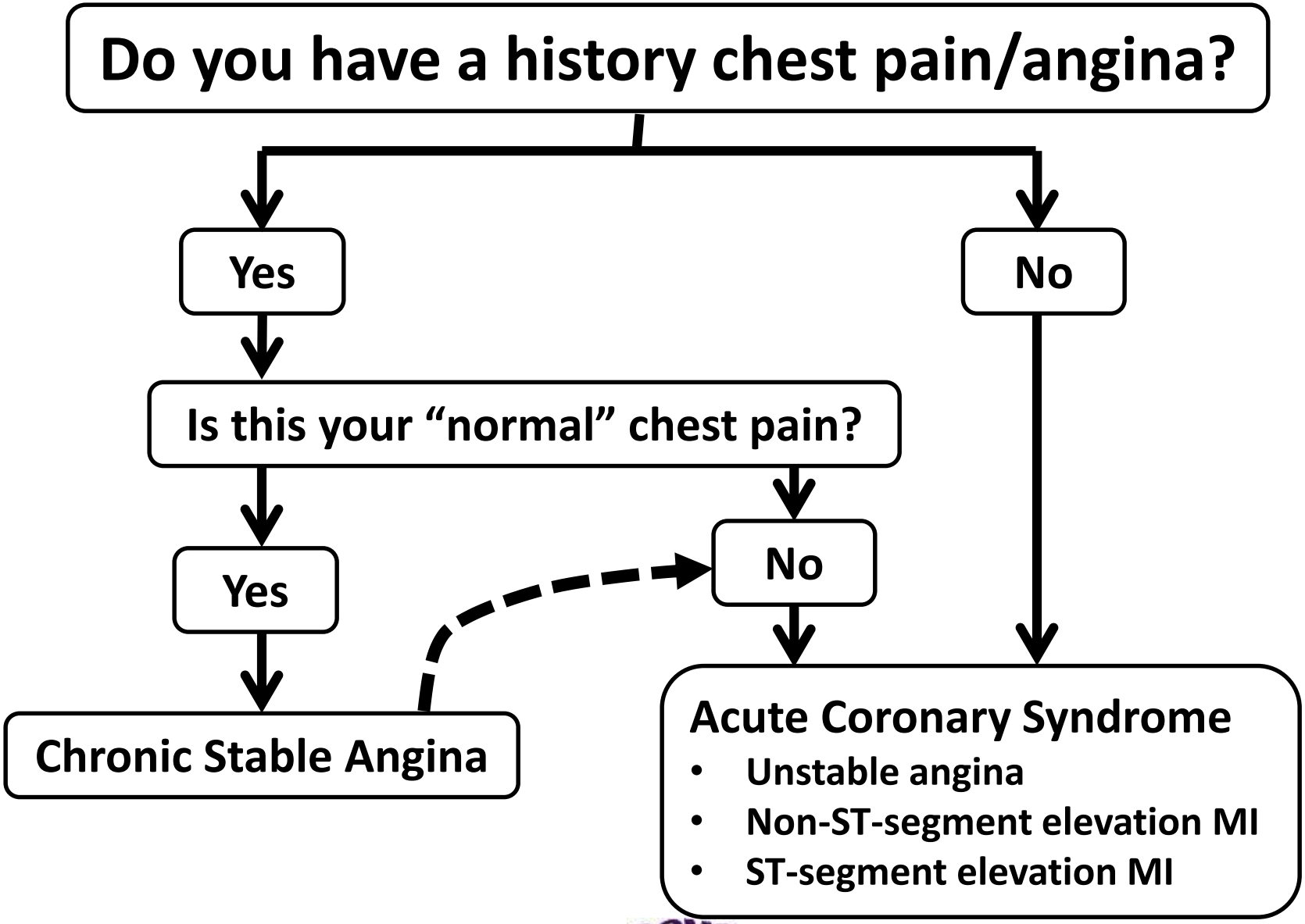
STEMI: complete occlusion

Chronic Stable Angina vs ACS

Is this your typical angina?

- ✓ **Location**
- ✓ **Radiation**
- ✓ **Severity of pain**
- ✓ **Other symptoms**
- ✓ **Response to NTG**

Chronic Stable Angina vs ACS



Cardiac Emergencies

Chronic Stable Angina

Chronic Stable Angina

Clinical manifestations

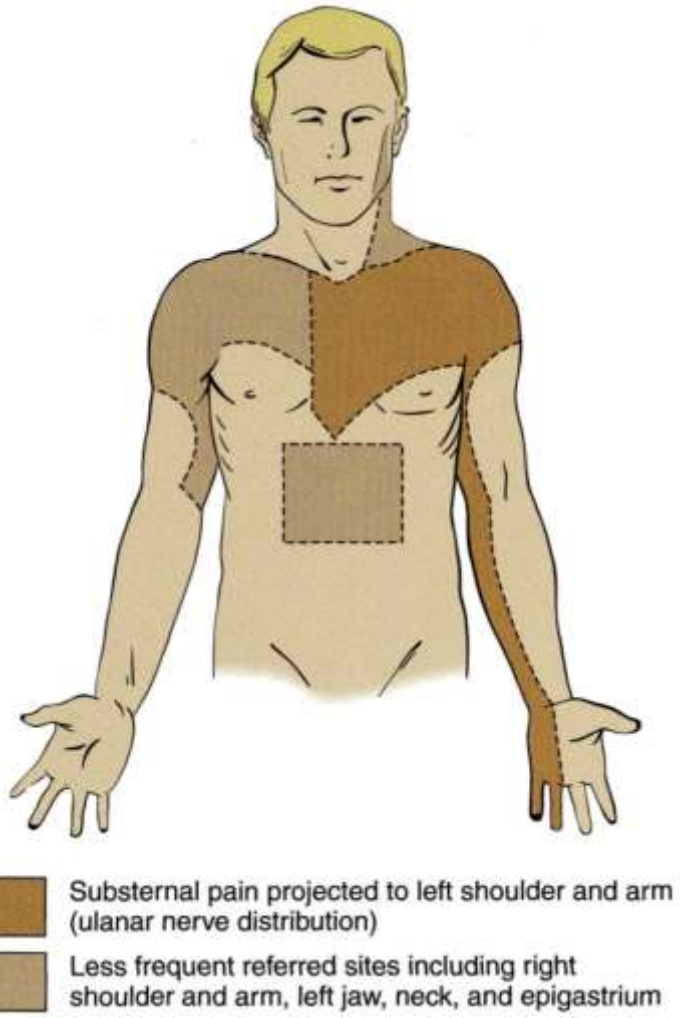
Substernal, squeezing / burning pain

"Heavy weight", "Indigestion"

Sudden onset with exertion or emotion

Radiates to shoulder, face, left arm

Subsides with rest or nitroglycerin



Chronic Stable Angina

Precipitating Factors

Physical activity	**Caffeine ingestion**
Hot, humid room	**Fever, anemia**
Cold weather	**Cigarette smoking**
Large meals	**Smog**
Emotional stress	**High altitudes**

Angina in the Dental Office

Anxiety, fear, pain

↓

Release of catecholamines (EPI)

↓

Increases BP, heart rate, contraction

↓

Increases myocardial oxygen demand

↓

Myocardial ischemia

↓

Chest Pain

Stress Management Protocol !

sOMs

Chronic Stable Angina Tx

Position patient comfortably (upright)

⬇

BLS as needed, monitor vital signs

⬇

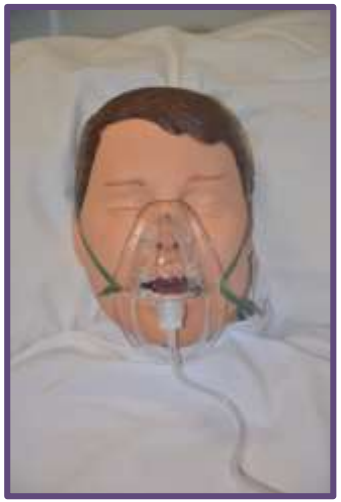
History of angina pectoris AND typical symptoms

⬇

Nitroglycerin 0.4mg sublingual

⬇

Administer oxygen, monitor VS



⬇

Repeat NTG q3-5' , Total 3 doses

⬇

<u>Normal</u> pain resolves with <u>normal</u> dose of NTG

⬇

Discharge – Confirm Vital Signs are stable

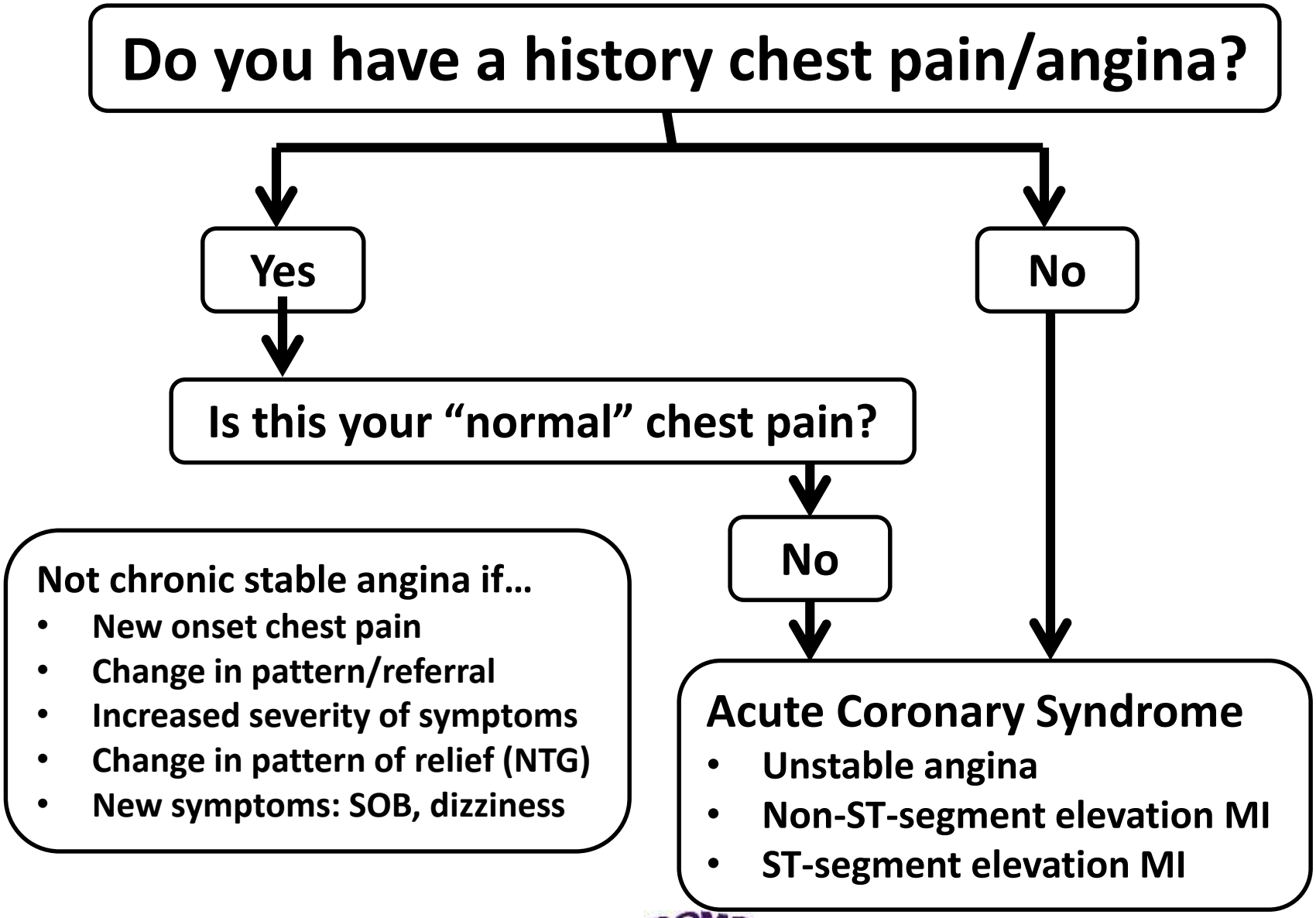
NTG Contraindication

Be <u>cautious</u> using it in patients taking these drugs

NTG Contraindication

Nitroglycerin is contraindicated in patients with hypotension (SBP < 90 mmHg), significant bradycardia (< 50 BPM), right ventricular (RV MI) infarction, or those who have recently taken a phosphodiesterase inhibitor such as Viagra, Cialis or Levitra.

Chronic Stable Angina vs ACS



Cardiac Emergencies

Acute Coronary Syndrome

(Unstable angina or MI)

Understanding Acute Coronary Syndrome (ACS)

ACS is a term for conditions in which blood flow to the heart is blocked, and includes myocardial infarction (heart attack) and unstable angina

What to look out for

Causes and risk factors

ACS is caused by a narrowing of the coronary arteries which blocks blood flow to the heart muscle and results in damage or death

Modifiable risk factors

- Dyslipidemia
- Smoking
- Hypertension

...as well as diabetes mellitus, obesity, physical inactivity

Nonmodifiable risk factors

- Male gender
- Advanced age

...as well as family history of heart disease, race

What can be done to help?

U.S. prevalence

1.1 MILLION

Americans are hospitalized with ACS each year*

According to AHA data, a significant number of patients died in the first year post heart attack:

26%

More than **1 out of 4 women** died within 1 year post heart attack**

19%

Nearly **1 out of 5 men** died within 1 year post heart attack**

Key risk factors for death post heart attack may include: patient age, severity of the ACS event, medical history, comorbidities

*2009 data; includes secondary discharge diagnoses.

**These numbers represent pooled data from 3 cardiovascular registries: The Framingham Heart Study, The Atherosclerosis Risk in Communities Study, and the Cardiovascular Health Study, of the National Heart, Lung, and Blood Institute. These data include patients who died within 1 year of their first MI, aged 45 years, from 1986-2007. The incidence of post-MI mortality rates may be higher or lower in different populations.

American Heart Association (AHA) Heart Disease and Stroke Statistics 2013 Update, a publication of statistics on heart disease, stroke, other vascular disease, and their risk factors written in conjunction with the Centers for Disease Control and Prevention, the National Institutes of Health, and other government agencies.

FOR U.S. AUDIENCES ONLY

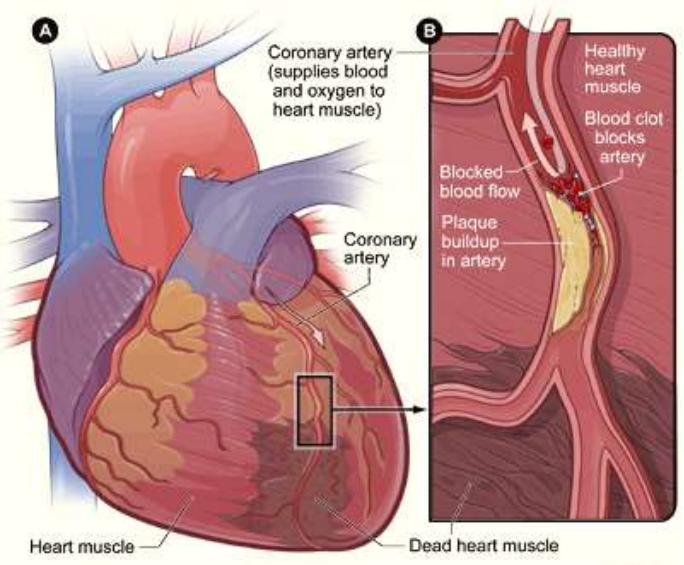
AstraZeneca

2917306 10/13

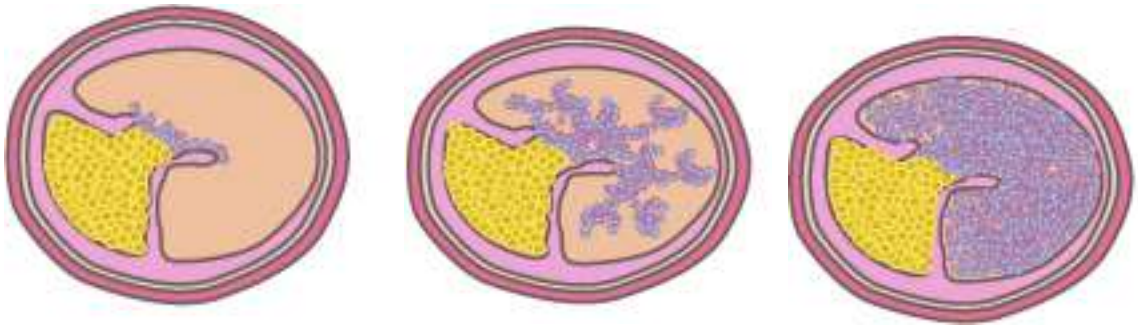
SOMS

ACS – Acute Coronary Syndrome

Etiology of ACS/Myocardial Infarction



Acute Coronary Syndrome



Unstable angina: platelet adhesion

NSTEMI: platelet aggregation

STEMI: complete occlusion

ACS – Acute Coronary Syndrome

Clinical manifestations

- ✓ Retrosternal severe pain
  - ✓ "Crushing", "choking"
- ✓ Usually > 30 minutes
- ✓ Radiates as angina
- ✓ N/V, palpitations, SOB
- ✓ "Impending doom"

From: **Symptom Presentation of Women With Acute Coronary Syndromes: Myth vs Reality**
Arch Intern Med. 2007;167(22):2405-2413. doi:10.1001/archinte.167.22.2405

Table 1. Acute Coronary Syndrome Presentation Without Chest Pain or Discomfort According to Sex—Summary of Studies From Large Cohorts

Source	Study Characteristic							Proportion Without Chest Pain, %		
	Study Description	Patient Population	Study Years	Sample Size	Mean Age, y	Age Adjusted	Race Adjusted	Men	Women	All
Brieger et al,[37] 2004	GRACE Registry	ACS	1999-2002	20 881	65.8	Yes	No	7.3	10.6	8.4
Canto et al,[8] 2000	National MI Registry	MI	1994-1998	434 877	69.3	Yes	Yes	28.6	38.6	32.7
Canto et al,[38] 2002	Alabama UA Registry	UA	1993-1999	4167	72.3	Yes	Yes	50.2	53.0	51.7
Culi et al,[39] 2002	CCUs Croatia	MI	1990-1995	1996	58.8	Yes	No	12.4	20.3	14.8
Dorsch et al,[7] 2001	United Kingdom	MI	1995	2096	70.6	Yes	No	17.6	24.6	20.1
Goldberg et al,[40] 1998	Worcester MI Study	MI	1986-1988	1360	67.7	Yes	No	18.0	23.0	20.0
Milner et al,[41] 2004	Worcester MI Study	MI	1997-1999	2073	70.2	Yes	No	30.9	45.8	37.3
Roger et al,[42] 2000	Olmsted County, Minnesota	UA	1985-1992	2271	63.0	Yes	No	25.0	19.0	22.0
Stern et al,[43] 2004	26 Hospitals, CCU, Israel	ACS	2000	2113	64.9	Yes	No	18.7	29.7	21.7
Cumulative	...	...	...	...	...	...	...	27.4 (76 036 of 276 933)	37.5 (73 003 of 194 797)	31.6 (149 039 of 471 730)

Abbreviations: ACS, acute coronary syndrome; CCU, coronary care unit; MI, myocardial infarction; UA, unstable angina.

Acute Coronary Syndrome Presentation Without Chest Pain or Discomfort According to Sex—Summary of Studies From Large Cohorts

HEART ATTACK

Know the symptoms. Take action.

CALL 9 1 1

Call 9–1–1 if You Feel Any of These Symptoms of a Heart Attack

Your chest hurts or feels squeezed.

One or both arms, your back, or stomach may hurt.

You may feel pain in the neck or jaw.

You feel like you can't breathe.

You may feel light-headed or break out in a cold sweat.

You may feel sick to your stomach.

SOMs

ACS – Management

Position comfortably

⬇

BLS, oxygen, NTG X 3 doses as in angina

⬇

**** If no response or if pain resolves, but returns or has ACS ****

⬇

Activate EMS

⬇

Administer fibrinolytics (ASA)

⬇

Monitor vital signs

⬇

Manage pain - narcotics

Morphine 2-15mg IV q15 minutes

Nitrous oxide is option

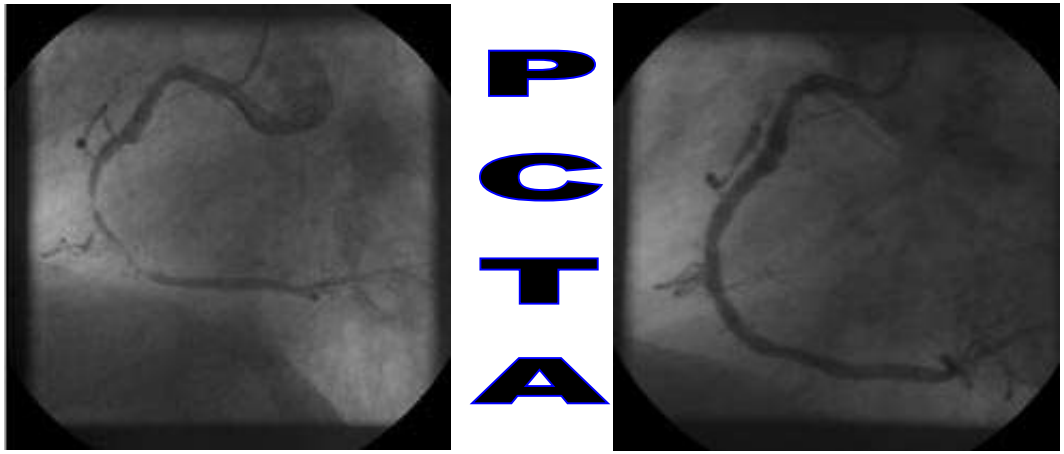
⬇

Transport to hospital - - ACLS

23% mortality reduction

ISIS-2 study

ACS – Management

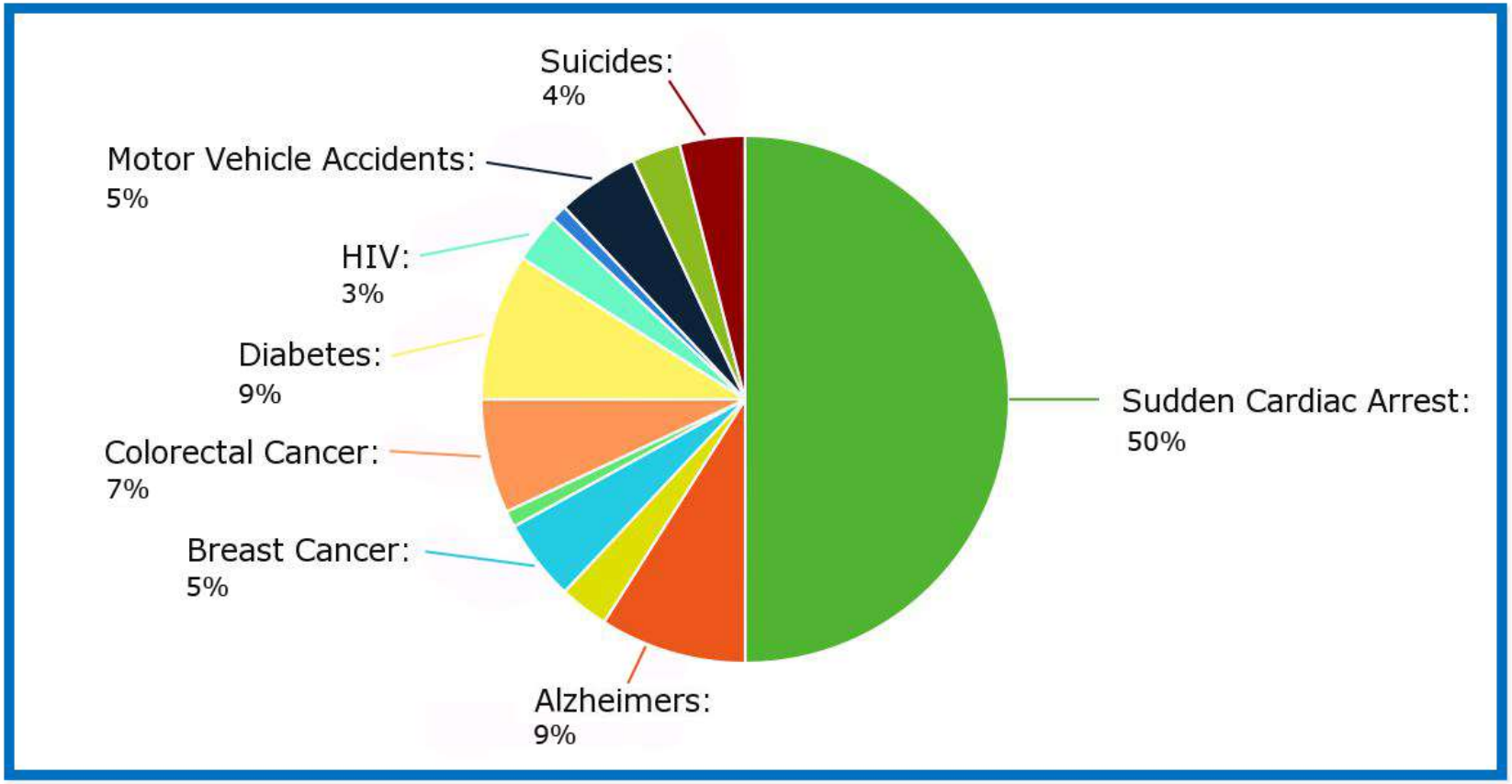


Time is Muscle

Cardiac Emergencies

Cardiac Arrest

Cardiac Arrest – #1 Cause of Death in U.S.



Cardiac Arrest

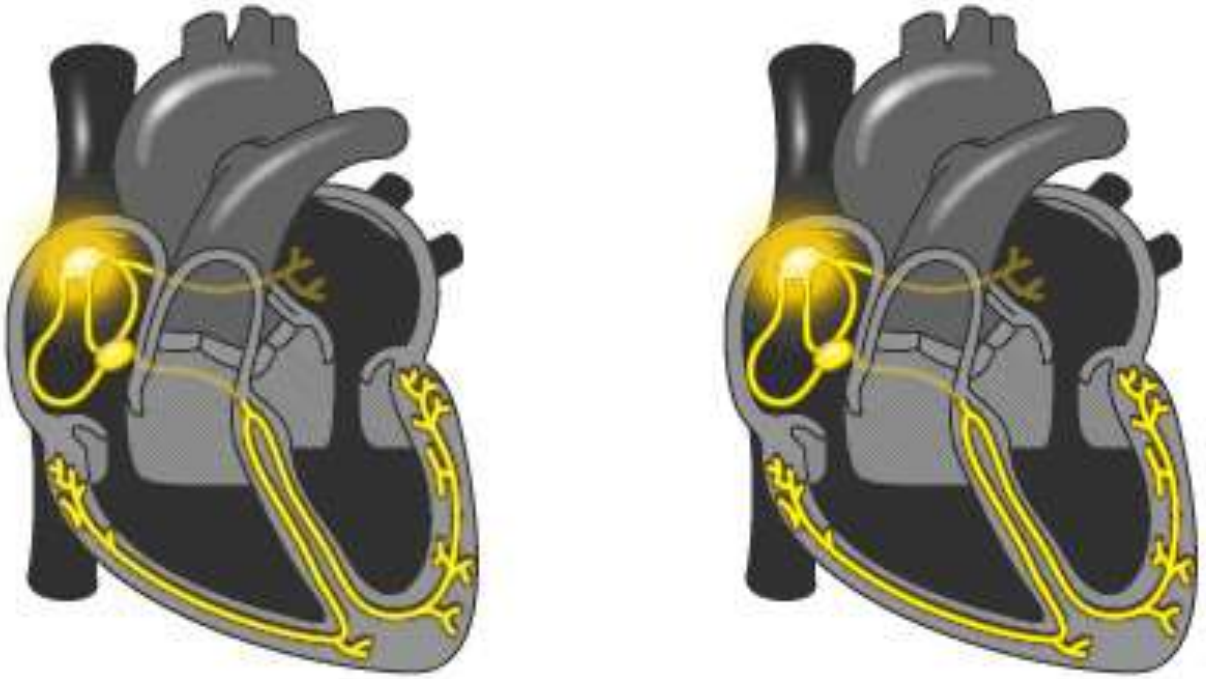
Possible causes

- Myocardial infarction
- → Sudden cardiac death
- Airway obstruction
- Drug overdose reaction
- Anaphylaxis
- Seizure disorder
- Acute adrenal insufficiency

Cardiac Arrest

Ventricular Fibrillation

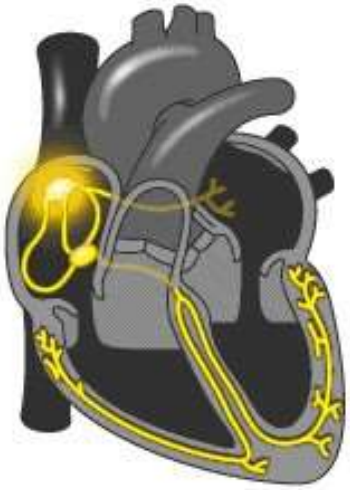
About 90% of cardiac arrests

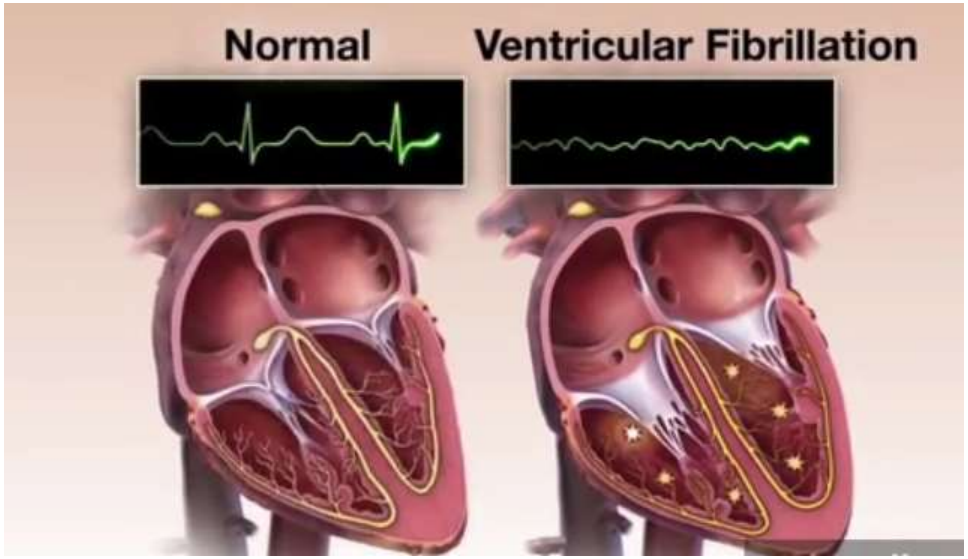


Cardiac Arrest

Ventricular Fibrillation

About 90% of cardiac arrests

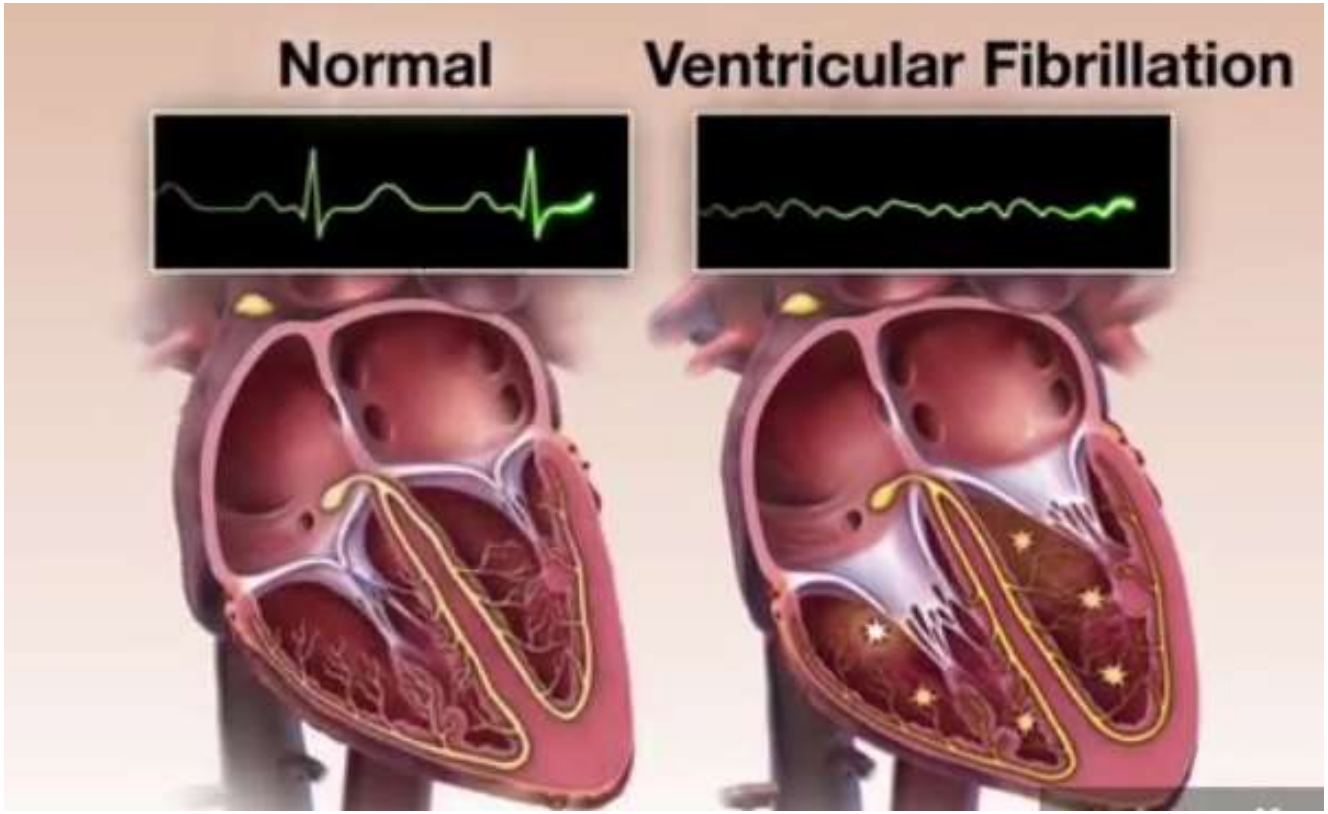




Cardiac Arrest

Ventricular Fibrillation

About 90% of cardiac arrests



Cardiac Arrest – Keys to Survival

Chain of Survival

Recognition and activation of the emergency response system

Immediate high-quality CPR

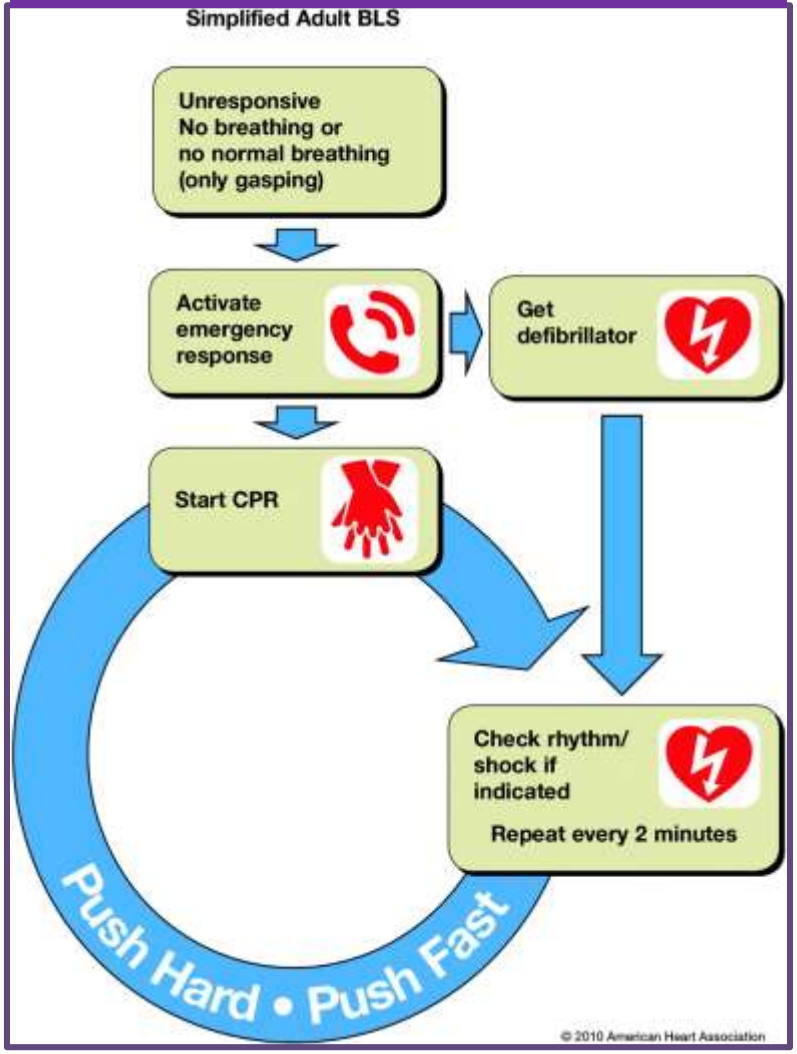
Rapid Defibrillation

Basic and advanced emergency medical services

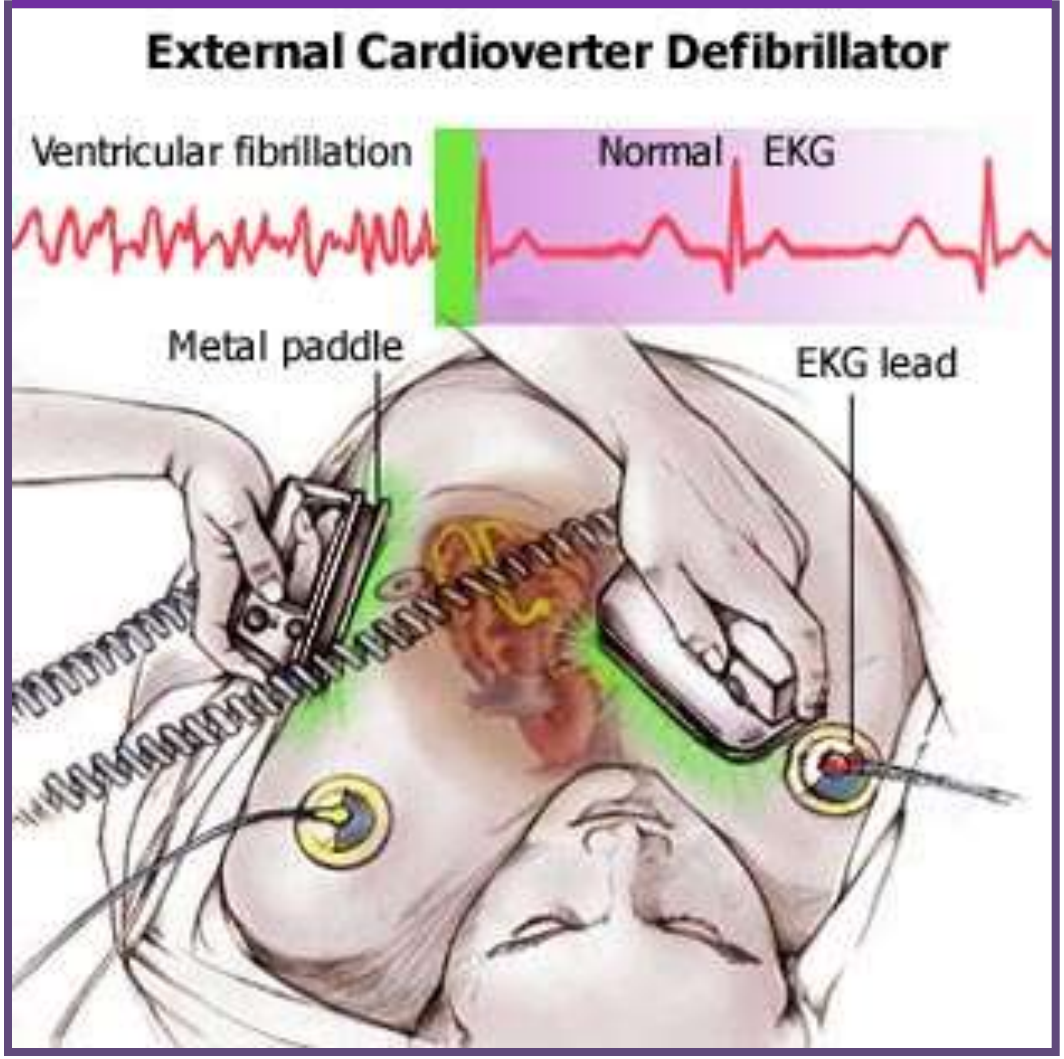
Advanced life support and postarrest care

Cardiac Arrest – Keys to Survival

High Quality CPR



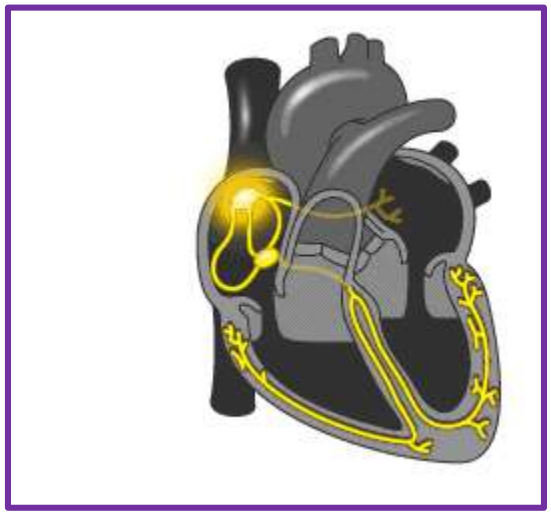
Defibrillation

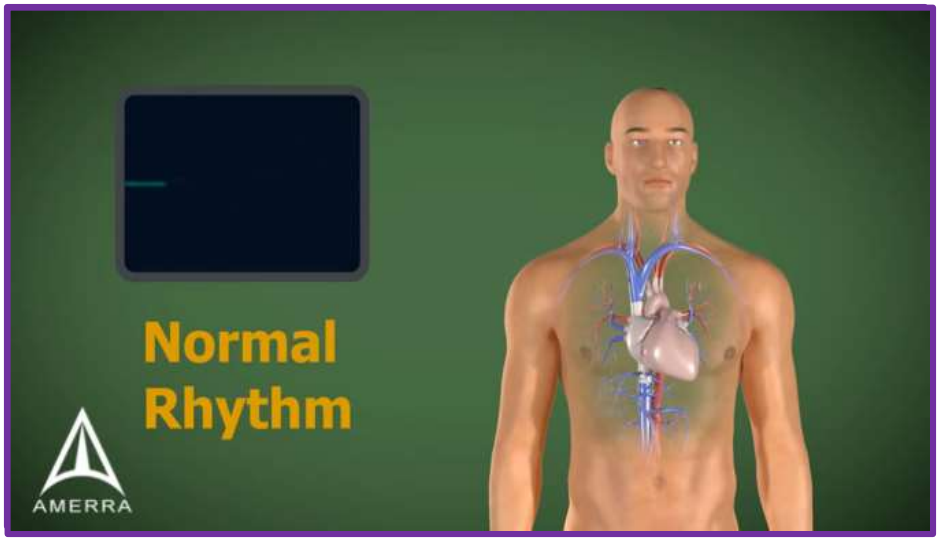


Cardiac Arrest

Ventricular Fibrillation

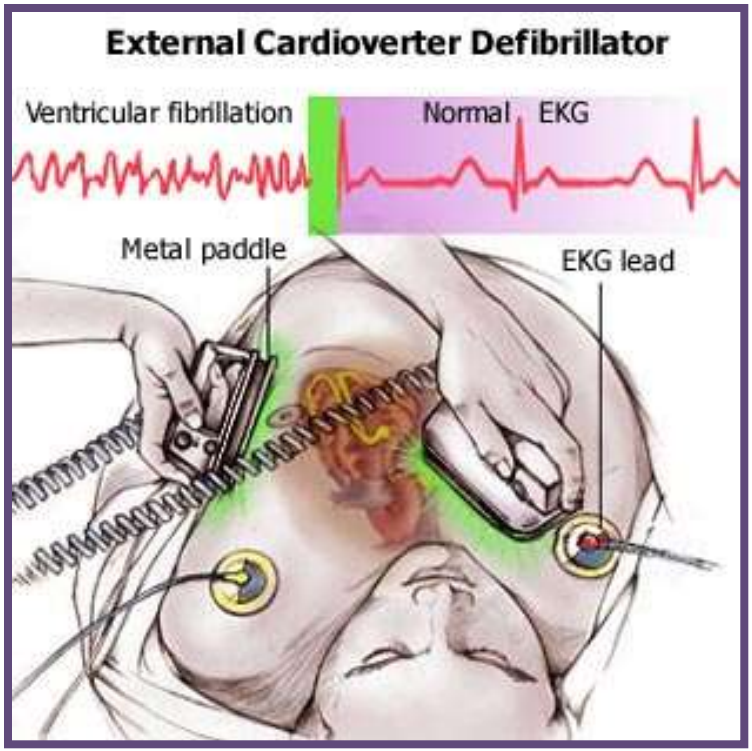
About 90% of cardiac arrests





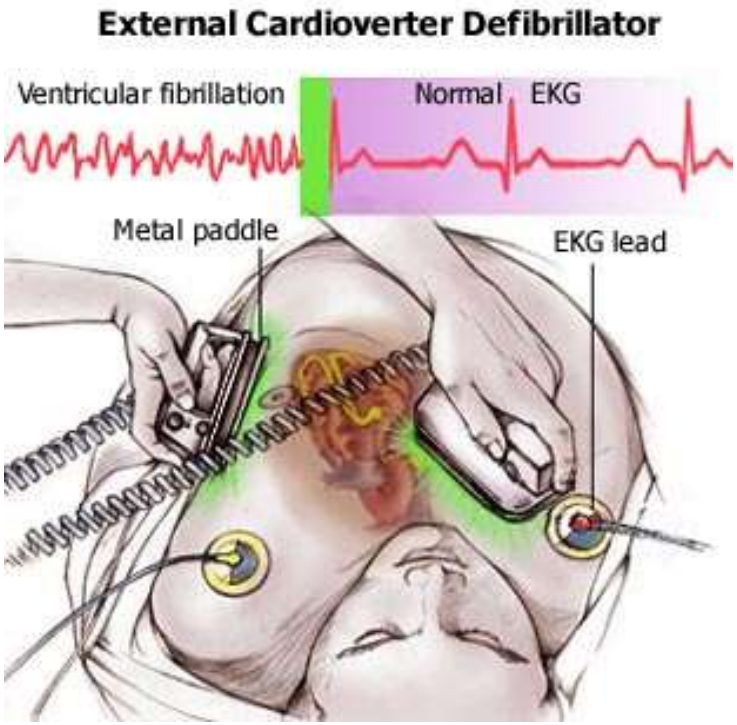
Cardiac Arrest – Keys to Survival

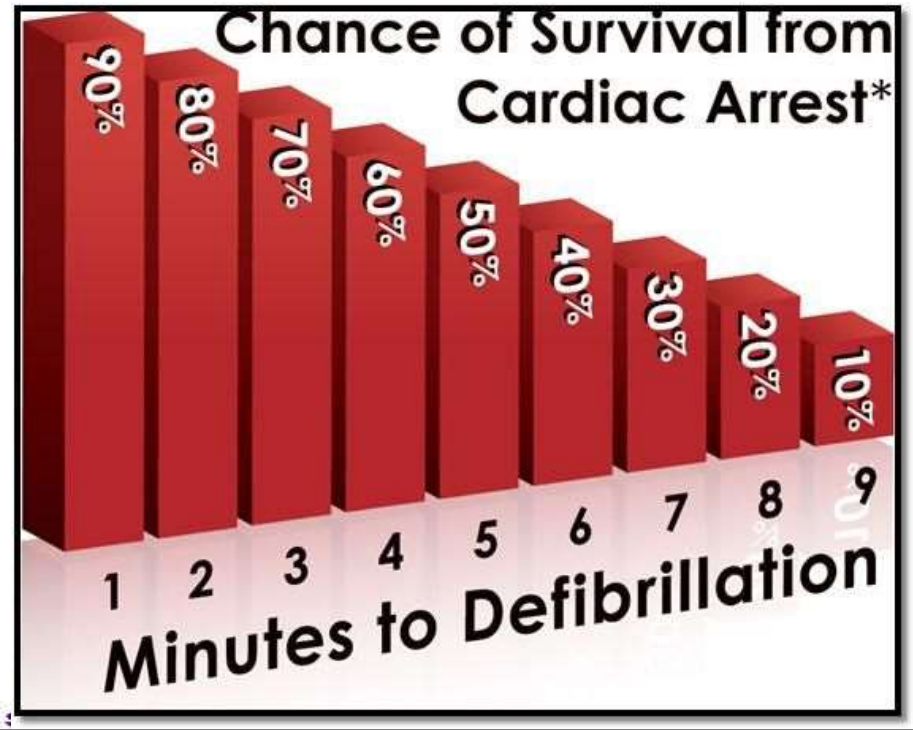
EARLY Defibrillation



Cardiac Arrest – Keys to Survival

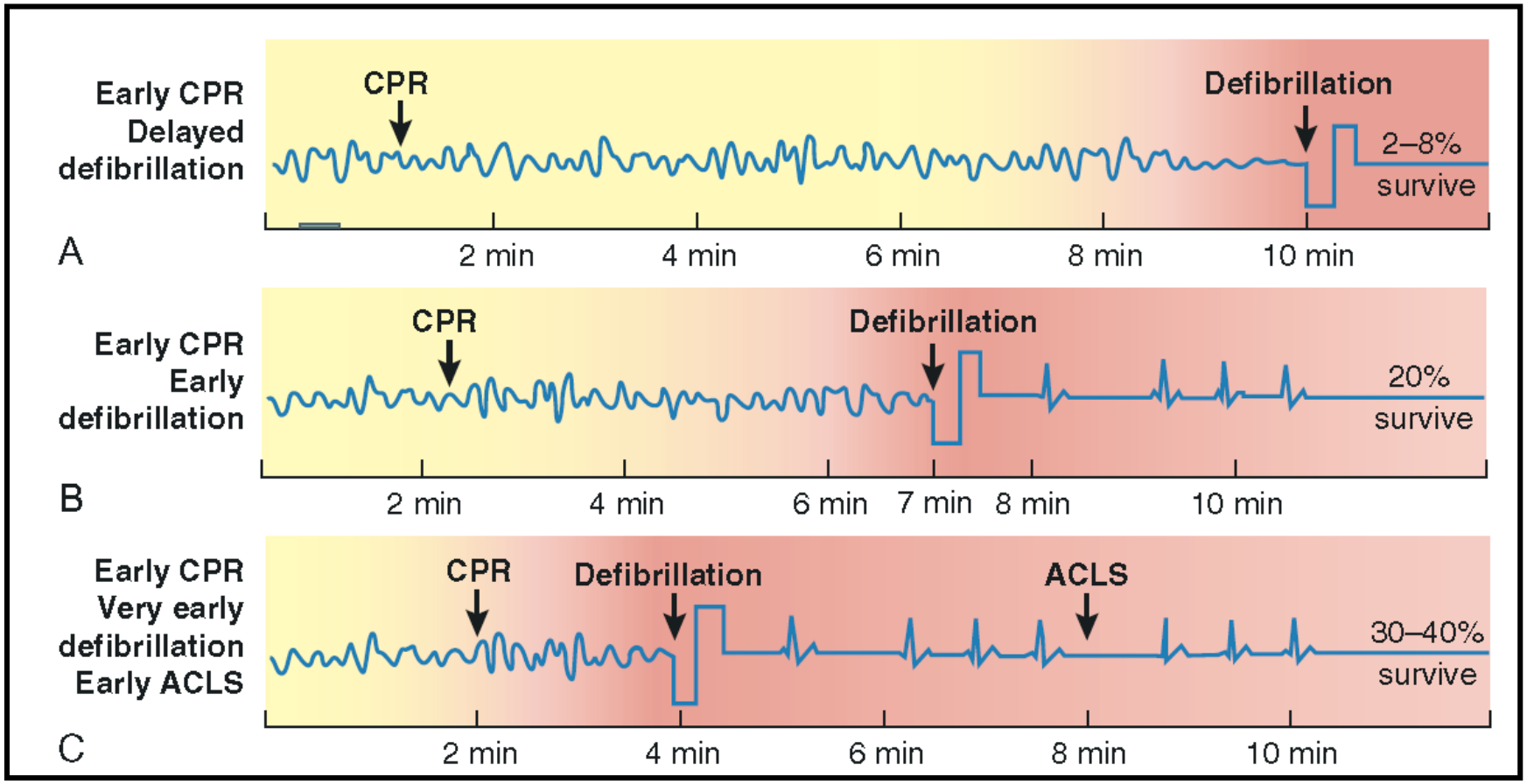
EARLY Defibrillation





Cardiac Arrest – Keys to Survival

EARLY Defibrillation



AED Operating Instructions

Instructions for operation – two steps

Step one

- **Patient is unconscious**
- **Patient is not breathing**
- **Patient is pulseless**

Step two

- **Apply defibrillator pads**
- **Follow verbal instructions**

Never stop CPR

Allergic Reactions

Allergic Reactions

Common Dental Allergens

Antibiotics

- Penicillin
- Cephalosporins
- Tetracyclines

Analgesics

- Aspirin-compounds
- Nonsteroidals

Opioids

- Meperdine
- Codeine

Antianxiety agents

- Barbiturates

Local anesthetics

- Esters: Benzocaine
- Sodium bisulfite
- Methylparaben

Others

- Acrylic monomer
- Latex

Allergic Reactions

Allergen

⬇

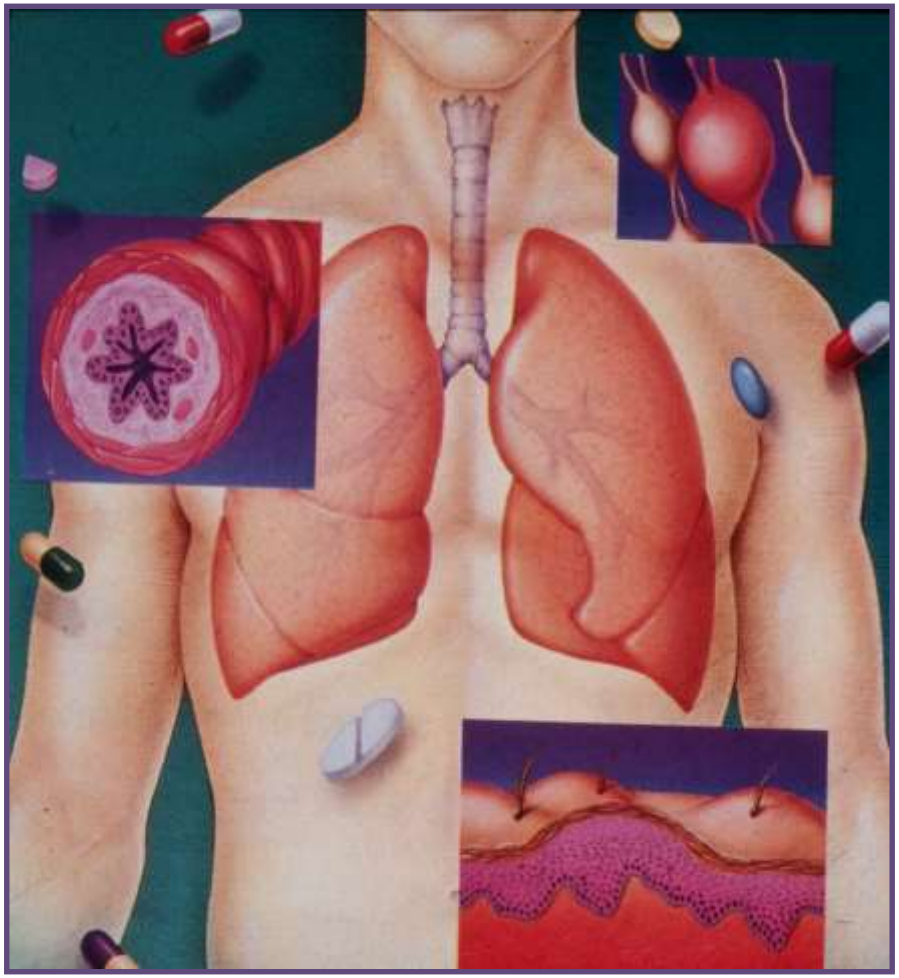
Mast cells & Basophils

⬇

Histamine
Leukotreines
ECF – Anaphylaxis
Kallikreins
Prostaglandins

⬇

Allergic phenomenon



Allergic Rxn - Cutaneous

Clinical manifestations

Increased vascular permeability

Vasodilation

↓

Urticaria / Hives

Rash

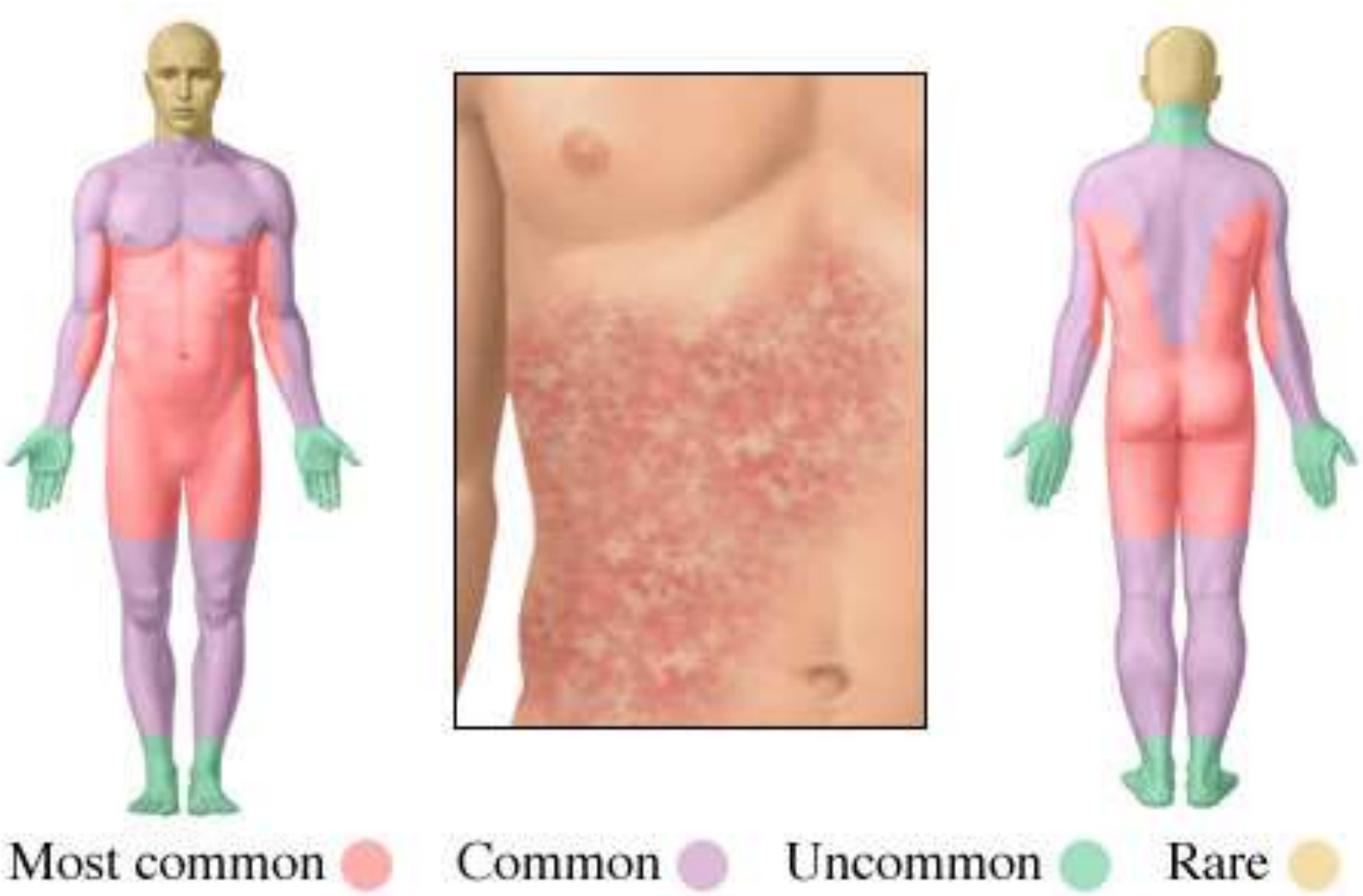
Pruritis (itching)

Tingling and warmth

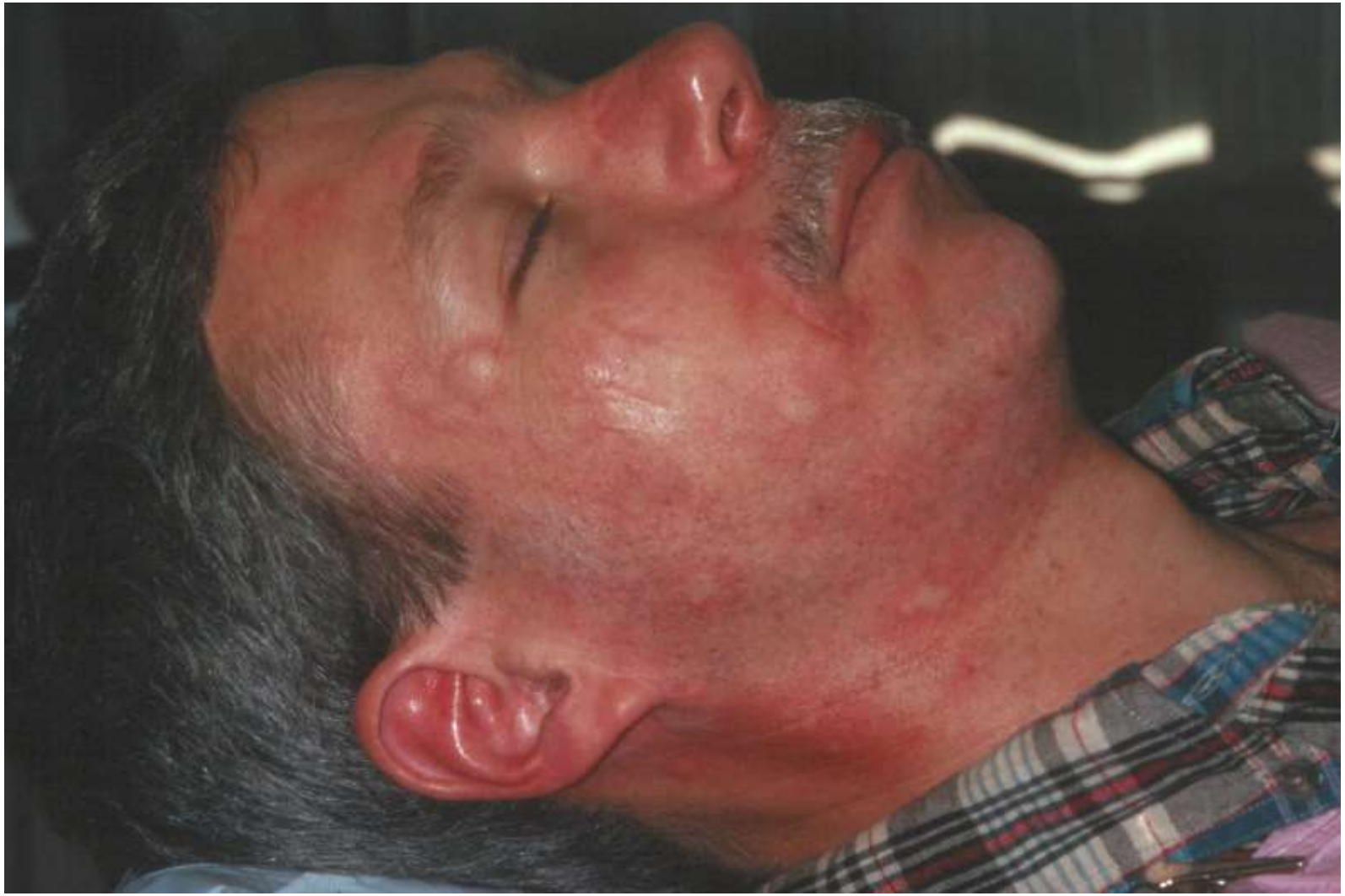
Flushing

Allergic Rxn - Cutaneous

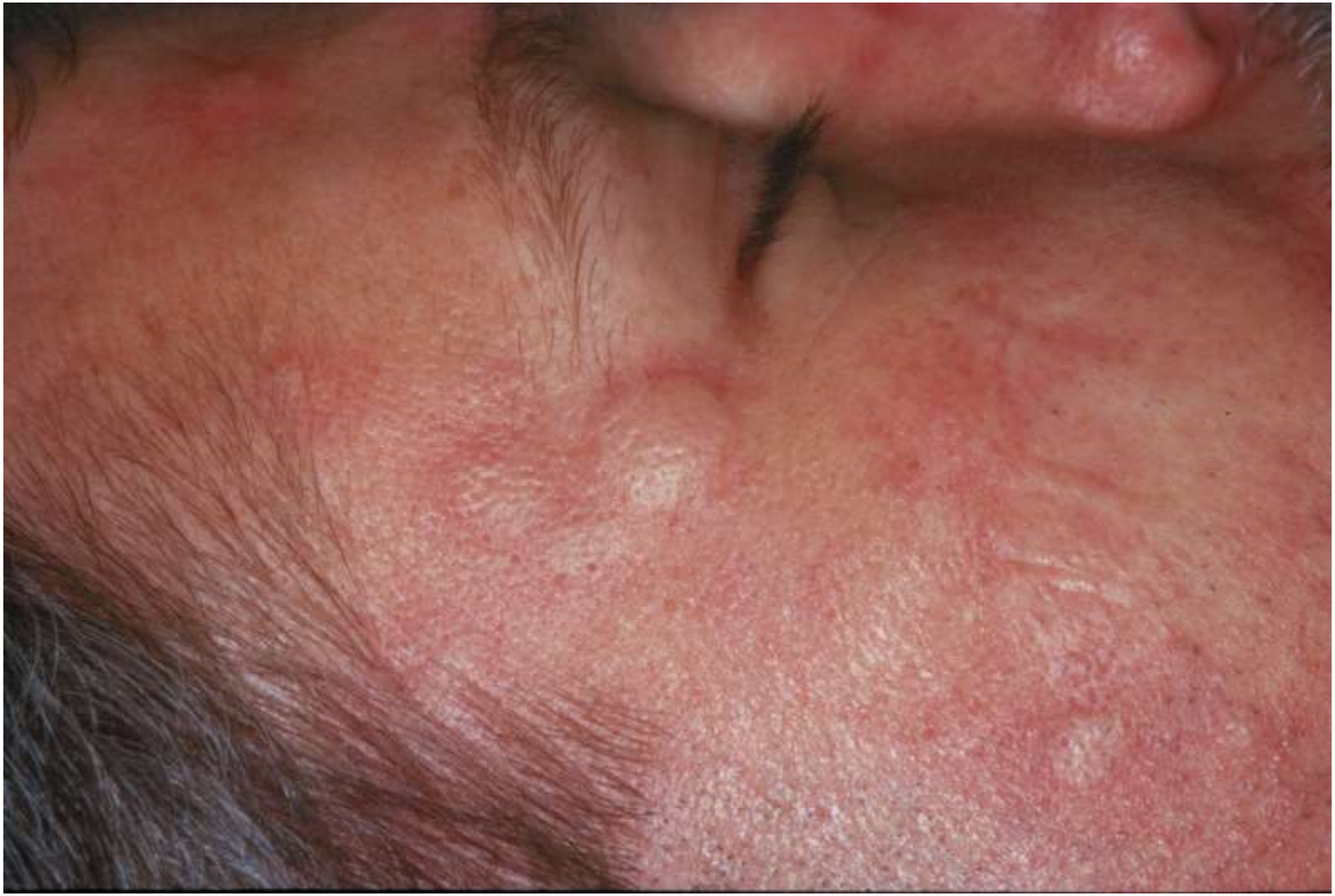
Typical Distribution Pattern



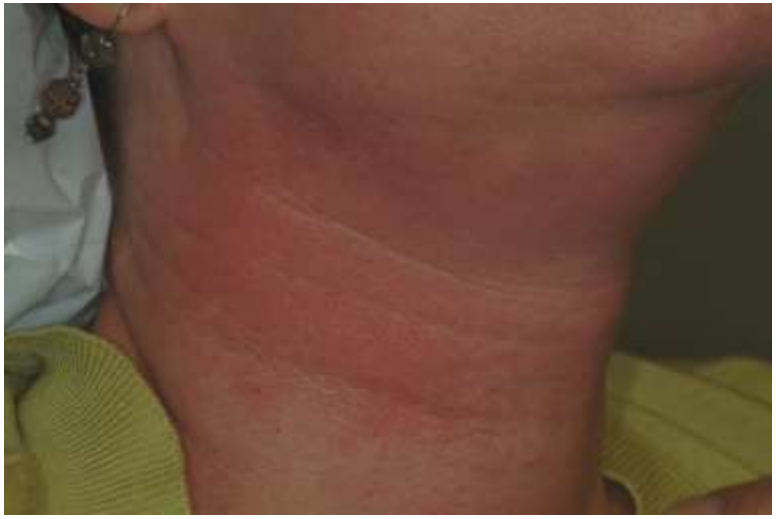
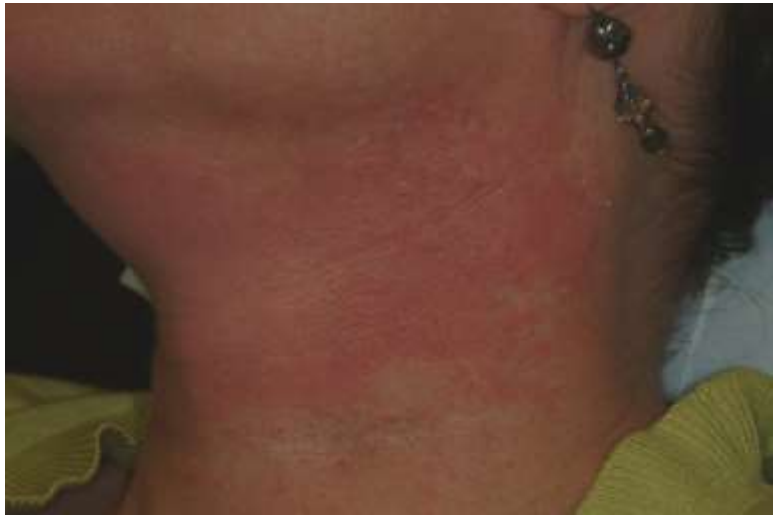
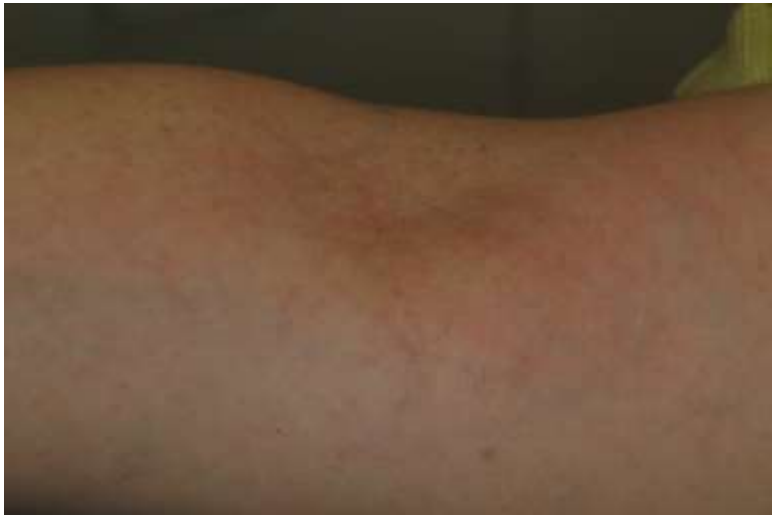
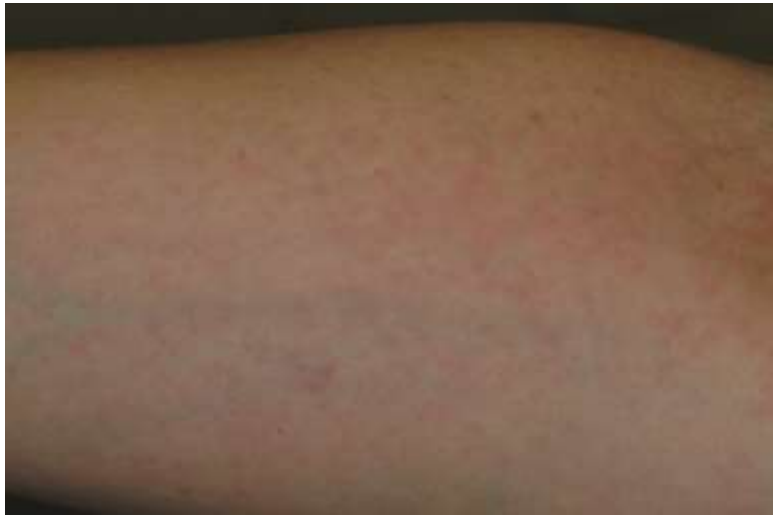
Allergic Rxn - Cutaneous



Allergic Rxn - Cutaneous



Allergic Rxn - Cutaneous

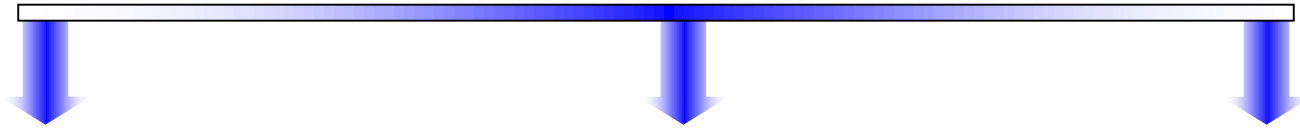
Allergic Rxn – Respiratory

Clinical manifestations

Increased vascular permeability & vasodilation

Increased exocrine gland secretions

Bronchiole smooth muscle contraction



Rhinitis

- Nasal congestion
- Nasal itching
- Rhinorrhea

Laryngeal edema

- Dyspnea
- Hoarseness
- Throat tightness
- Laryngeal stridor

Bronchospasm

- Cough
- Wheezing
- Tachypnea

Allergic Rxn – Cardiovascular

Clinical manifestations

Increased vascular permeability & vasodilation

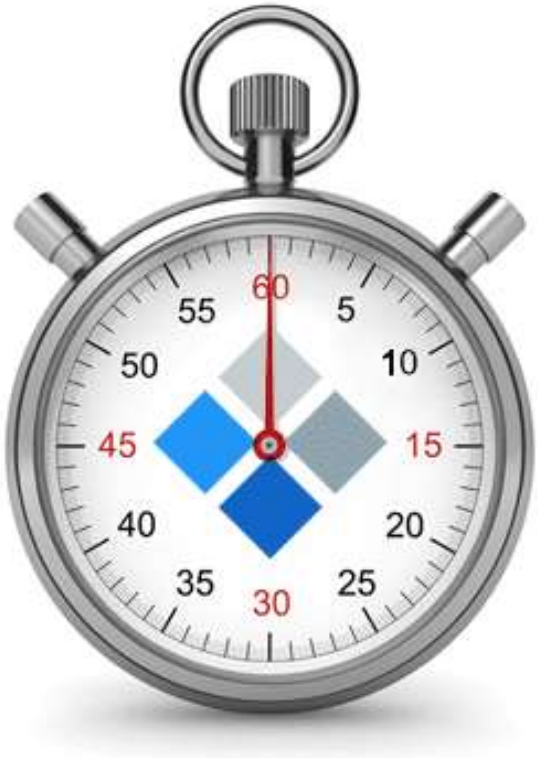
Decreased cardiac output

Loss of vasomotor tone

Circulatory collapse	Dysrhythmias	Cardiac arrest
Light-headed	Light-headedness	Pulselessness
Weakness	Weakness	EKG changes
Syncope	Palpitations	Vent fibrillation
Ischemic chest pain	Ischemic chest pain	Asystole

Allergic Rxn – Severity

When do we need to worry ?



Rapidity of onset

of signs and symptoms

Rapidity of progression

of signs and symptoms

Allergic Rxn – Treatment

Epinephrine

Reverses the pathologic processes causing the allergic reaction

Diphenhydramine

Antagonizes histamine, preventing progression of the allergic reaction

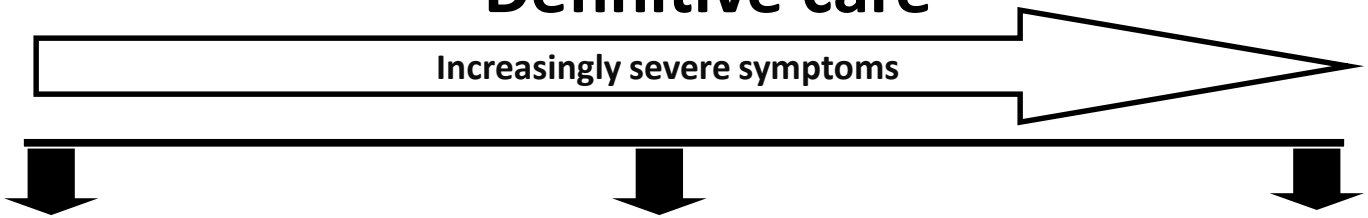
Tx Delayed-Onset Skin Rxn

Onset skin reaction (> 1 hour) from allergen

Position patient comfortably

Assess and perform BLS as needed

Definitive care



Observe patient

Administer oral histamine blocker prn

Benadryl 50mg oral

Administer IM + oral histamine blocker q4-6h

Benadryl 50mg IV or IM

Benadryl orally X 2-3 days (25 – 50mg qid)

Tx Rapid-Onset Skin Rxn

Onset skin reaction (< 1 hour) from allergen

Position patient comfortably

↓

Assess and perform BLS as needed

↓

Definitive care

NO ← **Cardiac or respiratory involvement ?** → **YES**

Benadryl 50mg oral / IM

↓

Discharge

Oxygen, start IV

↓

Epinephrine 0.3mg SQ, IM, IV

↓

Activate EMS

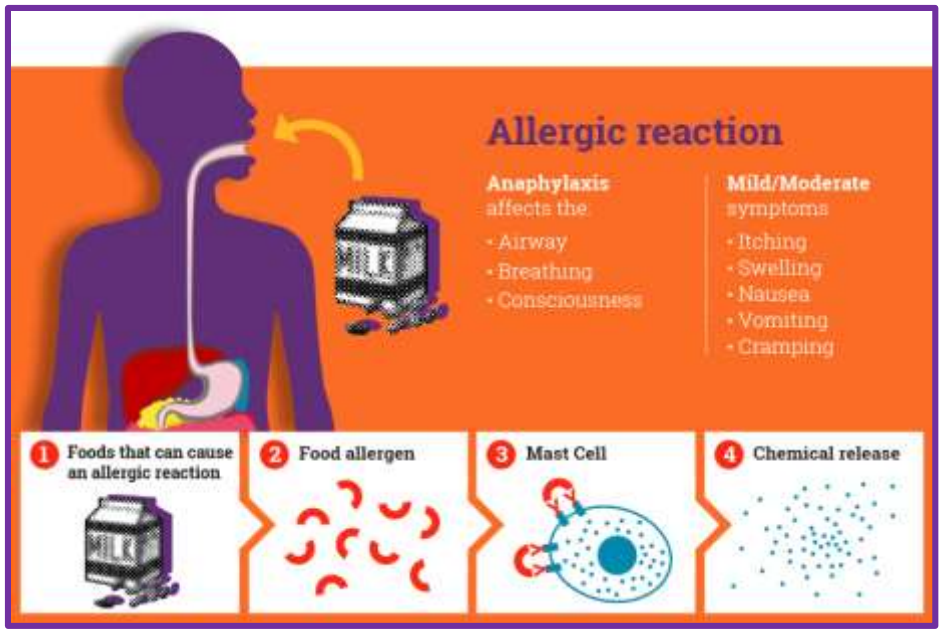
↓

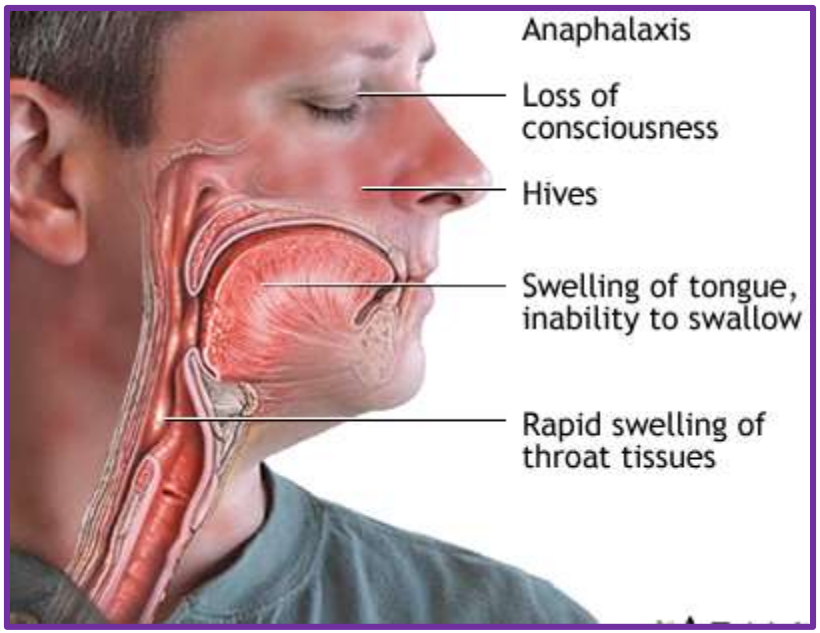
Benadryl 50mg IV or IM

↓

Hospital

Anaphylaxis





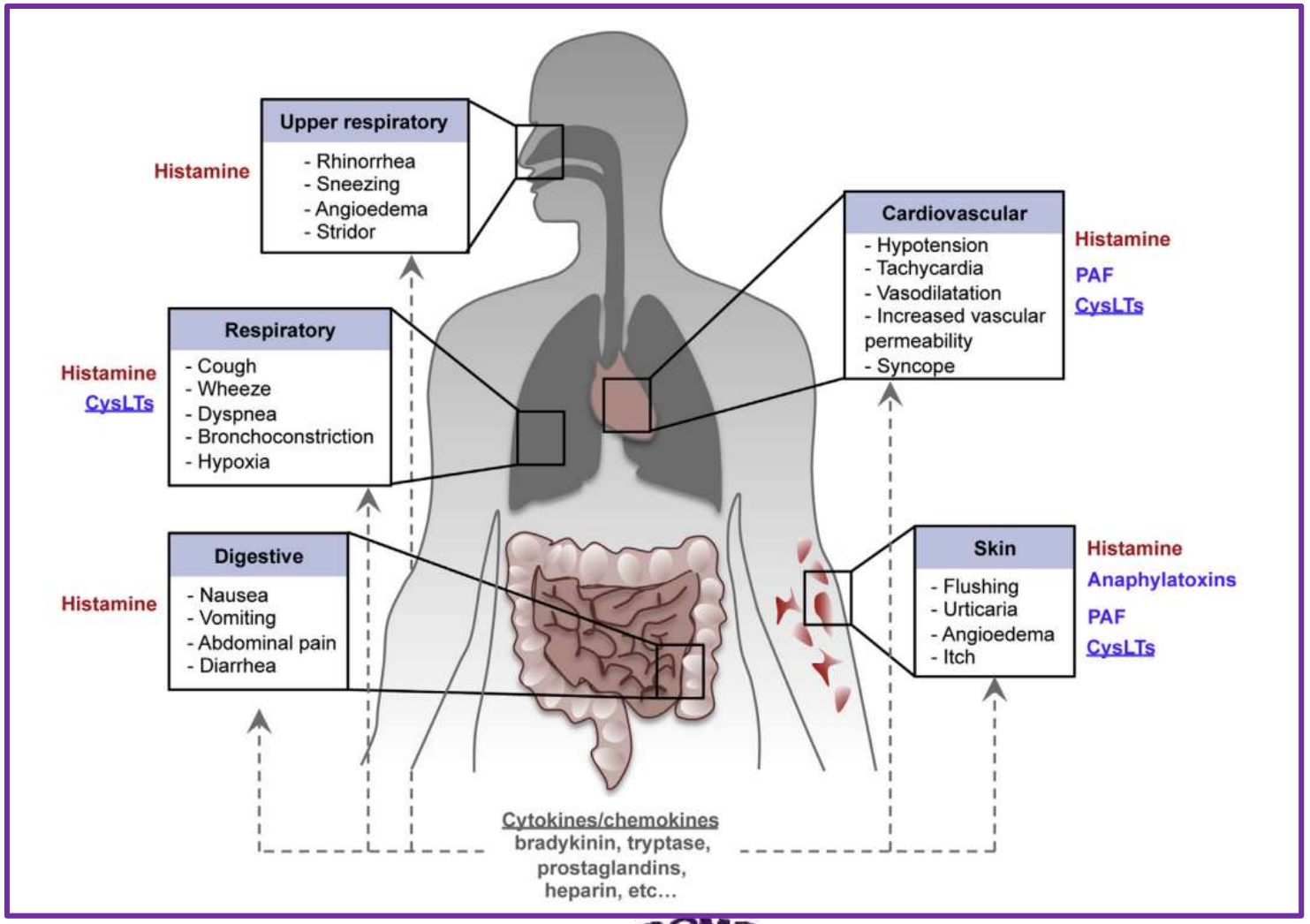
Anaphylaxis is a severe and potentially fatal allergic reaction. It may start suddenly within seconds or minutes, or take a few hours to develop the following contact with an allergen which is a substance that is capable of producing an allergic reaction. A severe anaphylactic reaction is sometimes known as anaphylactic shock.

Allergic Rxn => Anaphylaxis

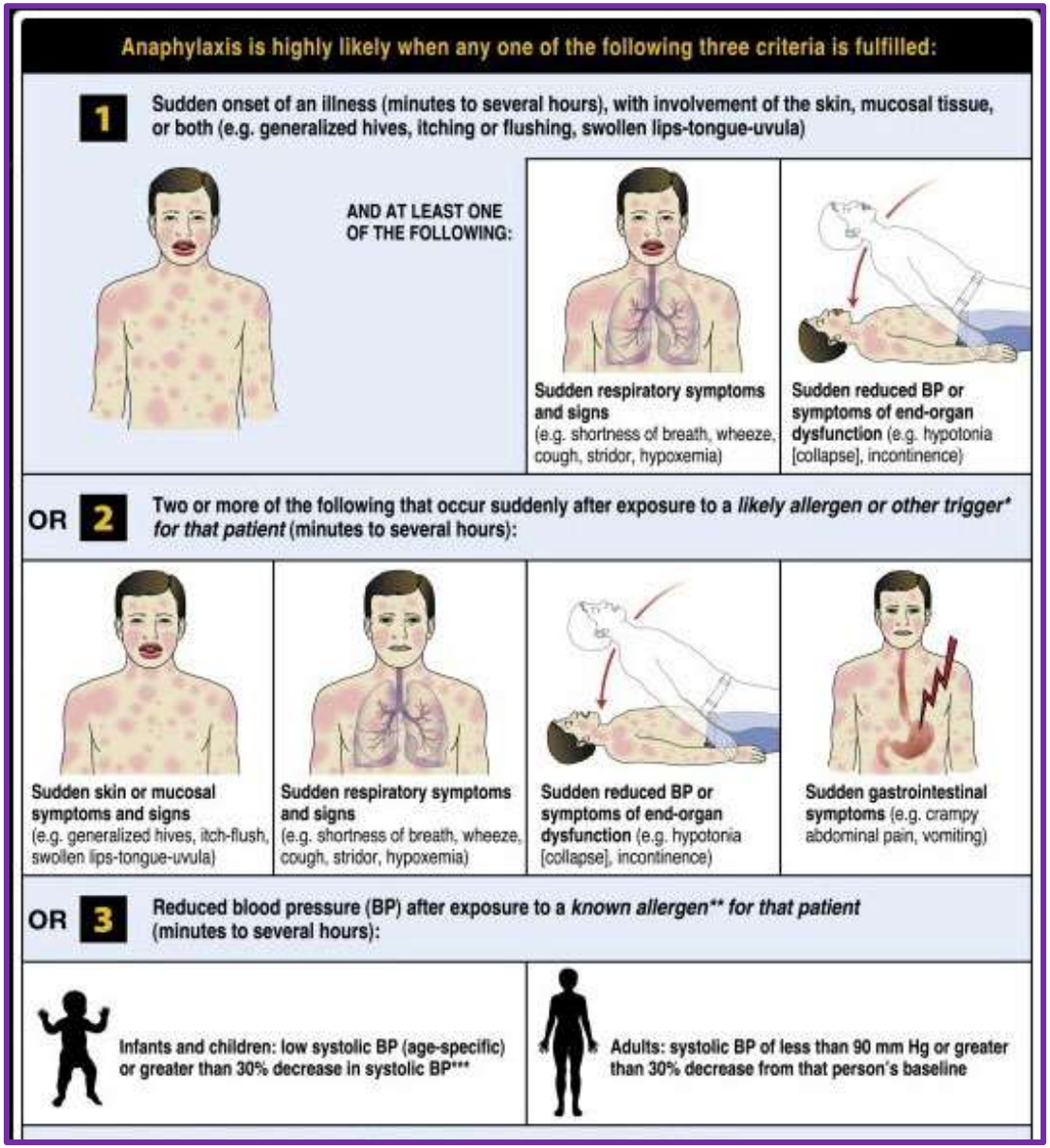
- ✓ **Allergic rxn:**
  - ✓ **Localized rxn, involving single system, e.g. Urticaria, angioedema, contact dermatitis**
- ✓ **Anaphylaxis**
  - ✓ **Severe systemic allergic rxn**
  - ✓ **Hive/angioedema NOT universally present**
- ✓ **Anaphylactic Shock**
  - ✓ **Above, plus hypotension and other signs of shock**

Anaphylaxis – Clinical Manifestations

Multi-system involvement



Anaphylaxis – Clinical Manifestations



Tx Anaphylactic Rxn

Position patient supine, legs elevated

Assess and perform BLS as needed, VS + oxygen

Activate EMS

Administer Epinephrine 0.3mg q5 min IM or IV

+

Benadryl 50mg IM, IV

+

Solucortef 100mg IV

EMS => ER/Hospital