Acute Coronary Syndrome

Heart Failure

OPL Patient Profile CE Program – 2017

Acute Coronary Syndrome

OPL Patient Profile CE Program – 2017

Learning Objectives

- Review basic concepts related to acute coronary syndrome (ACS)
- Differentiate between different types of ACS
- Devise evidence-based treatment plans for managing ACS and discuss the different medications used
- Highlight the role of the pharmacists in ACS management

Guidelines

- American College of Cardiology Foundation / American Heart Association (ACCF/AHA) Guidelines
  - 2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction
    - *Circulation. 2013;127:529-555; originally published online December 17, 2012*
  - 2014 ACCF/AHA Focused Update of the Guideline for the Management of Patients With Unstable Angina/Non–ST-Elevation Myocardial Infarction
    - *Circulation.* 2014;130:2354-2394

Epidemiology – Lebanon

WHO May 2014

Coronary Heart Disease Deaths

Total Deaths:

6,443 (34.41%)

Age Adjusted Death Rate:

132.65 per 100,000 of population

World Rank:

Lebanon #44

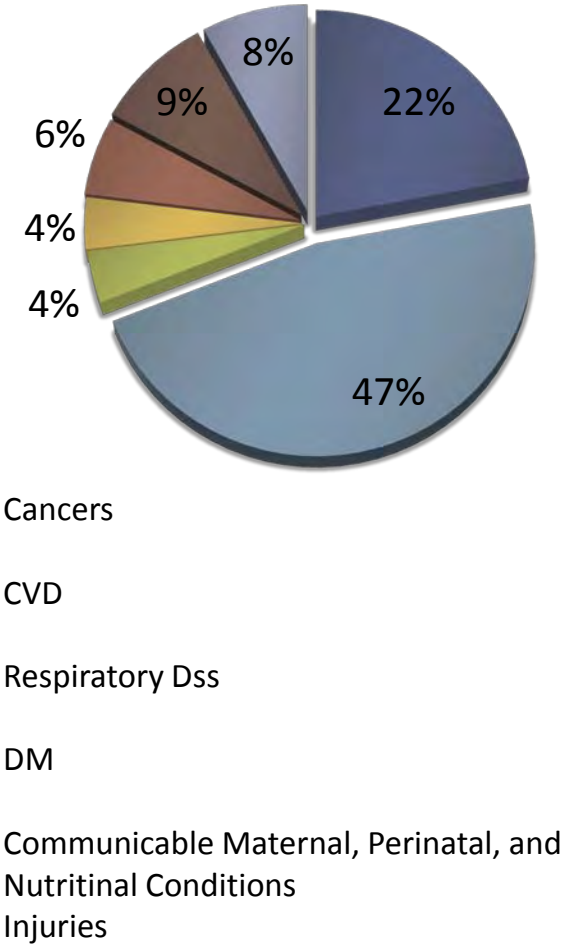
http://www.worldlifeexpectancy.com/country-health-profile/lebanon

Epidemiology – Lebanon

Non-communicable diseases (NCDs) ➔ 85% of total deaths

Cardiovascular diseases (47%)

- Ischemic heart disease (24%)
- Cerebrovascular disease (9%)
- Hypertensive heart disease (5%)
- Inflammatory heart disease (2%)



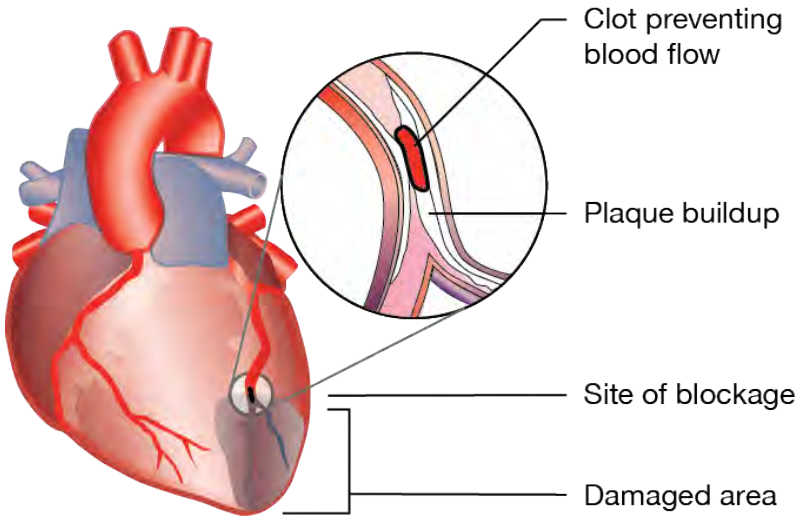
https://www.escardio.org/Sub-specialty-communities/European-Association-of-Preventive-Cardiology-(EAPC)/Prevention-in-your-country/Country-of-the-Month-Lebanon

Definition

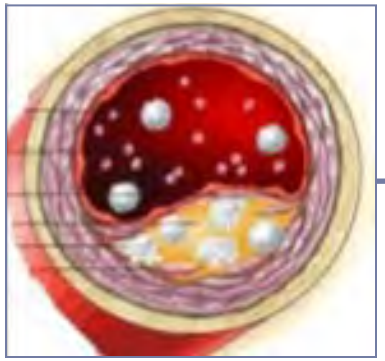
Occlusive or partially occlusive coronary artery thrombus

Diminished myocardial blood flow

Acute Coronary Syndrome



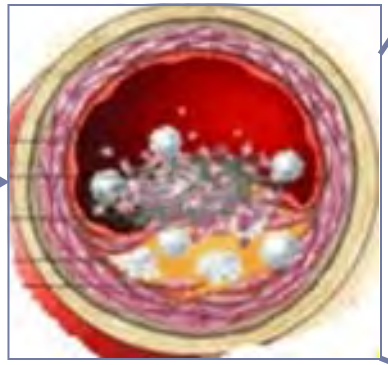
Pathophysiology



Vulnerable Plaque

Plaque Rupture
(55-80%)

Exertion, BP, HR,
Vasoconstriction



•Platelet aggregation
•Thrombus formation
•Vasospasm

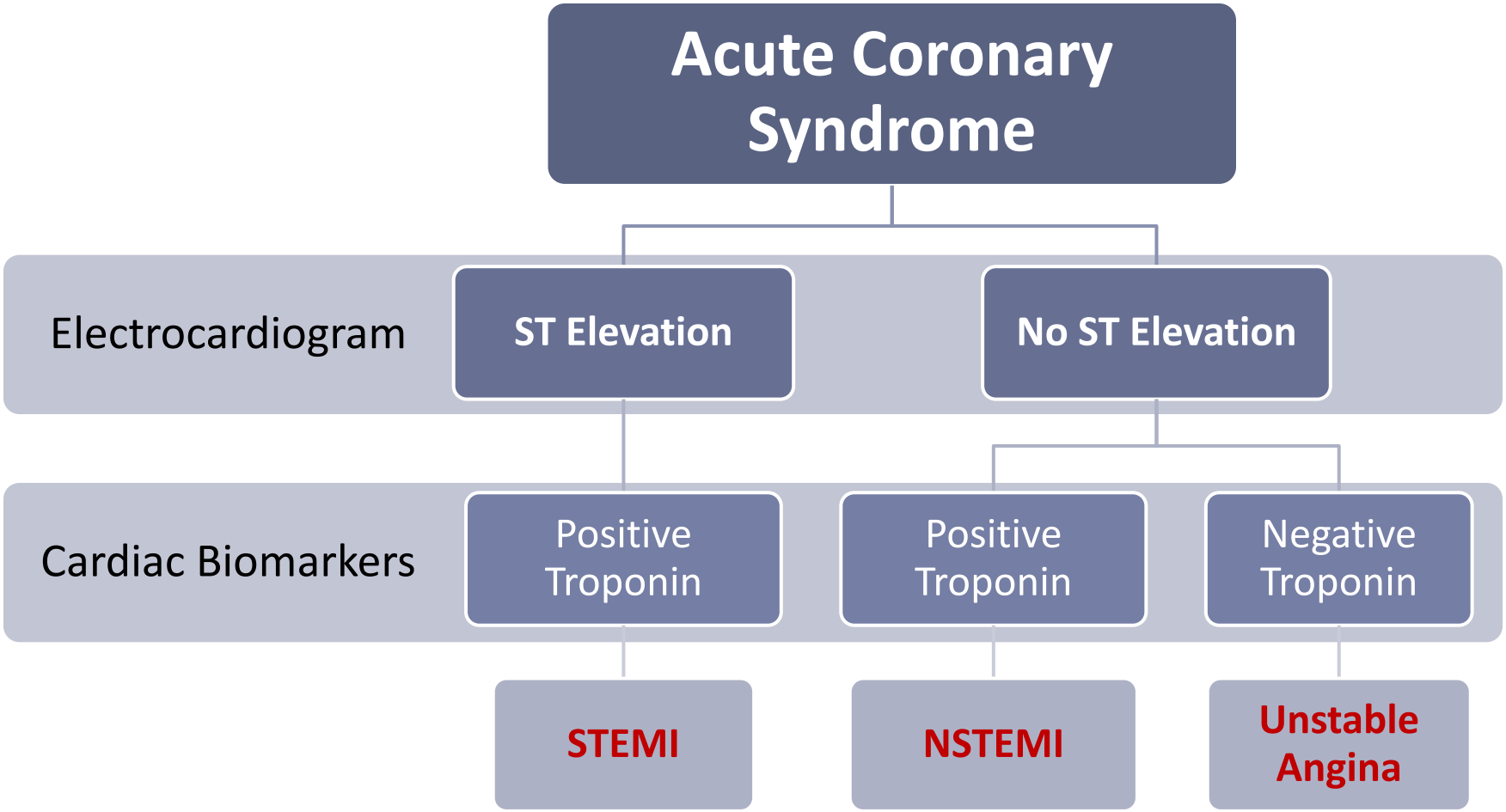
Incomplete occlusion
Distal mobilization

Unstable angina
NSTEMI

Complete occlusion

STEMI

Classification



Diagnosis

1. History (angina or angina equivalent)

2. Acute ischemic ECG changes

At least 2 of the following:

3. Cardiac biomarkers (Troponin T & CKMB)

4. Absence of another identifiable etiology

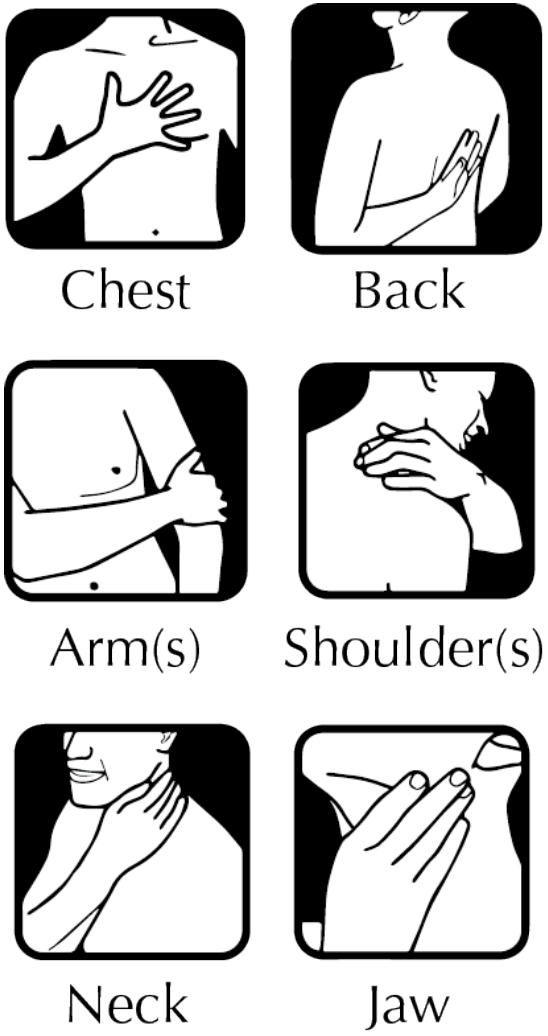
Clinical Presentation

Chest Discomfort (tightness, pressure, heaviness)

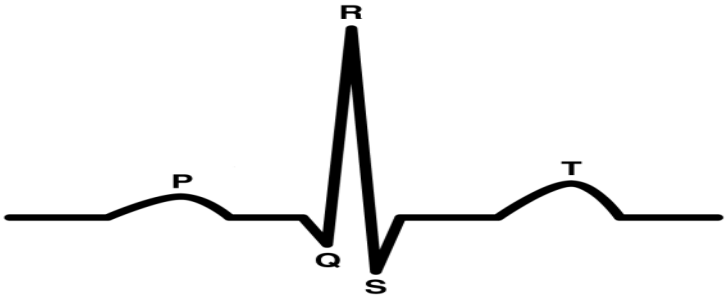
- Midline anterior
- At rest or for a prolonged period (> 10 minutes, not relieved by sublingual nitrates)
- Severe new-onset angina
- May radiate to the shoulder, down the left arm, to the back, or to the jaw or epigastric pain

Associated Symptoms

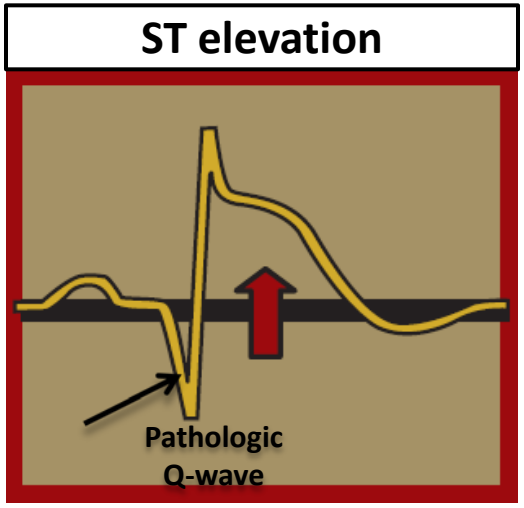
- Nausea, vomiting, diaphoresis, and shortness of breath
- Recent research ➔ women, elderly and diabetics are less likely to experience chest pain as a symptom

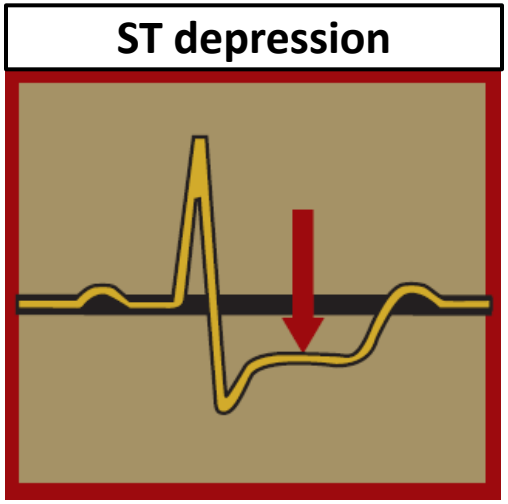


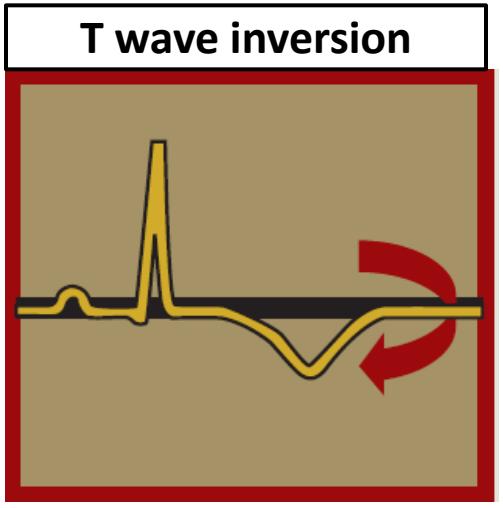
ECG findings



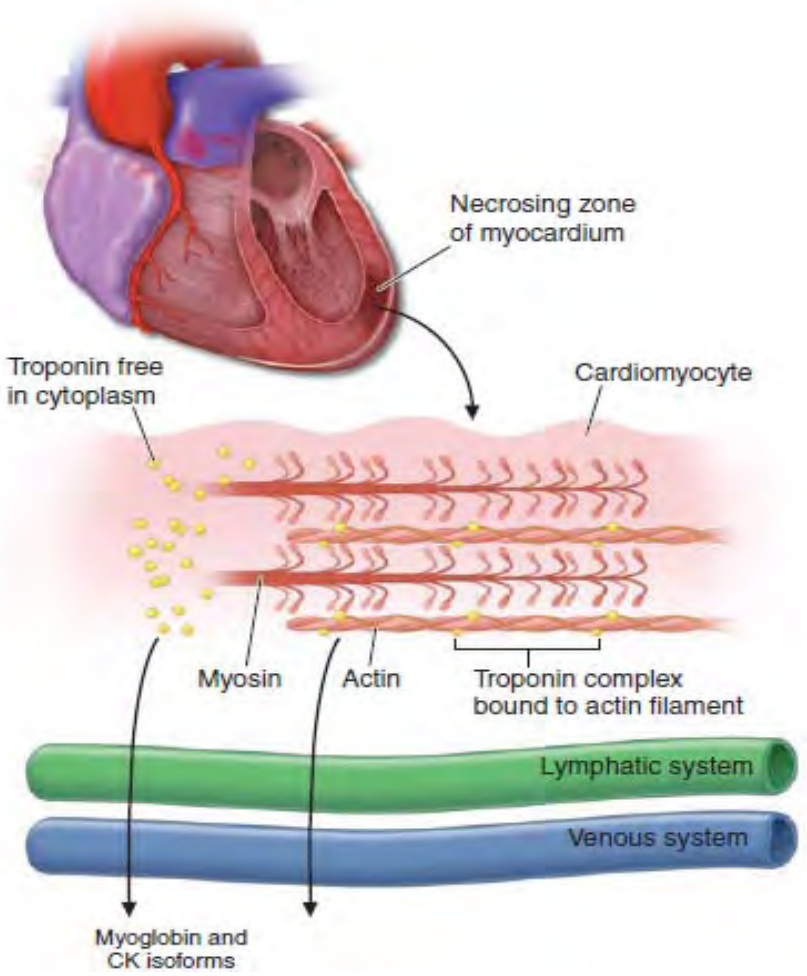
12 Lead ECG	STEMI	NSTEMI/UA
ST segment	Elevation	Depression
T-wave		Inversion
Pathologic Q-wave	Frequently seen (transmural MI)	Less common

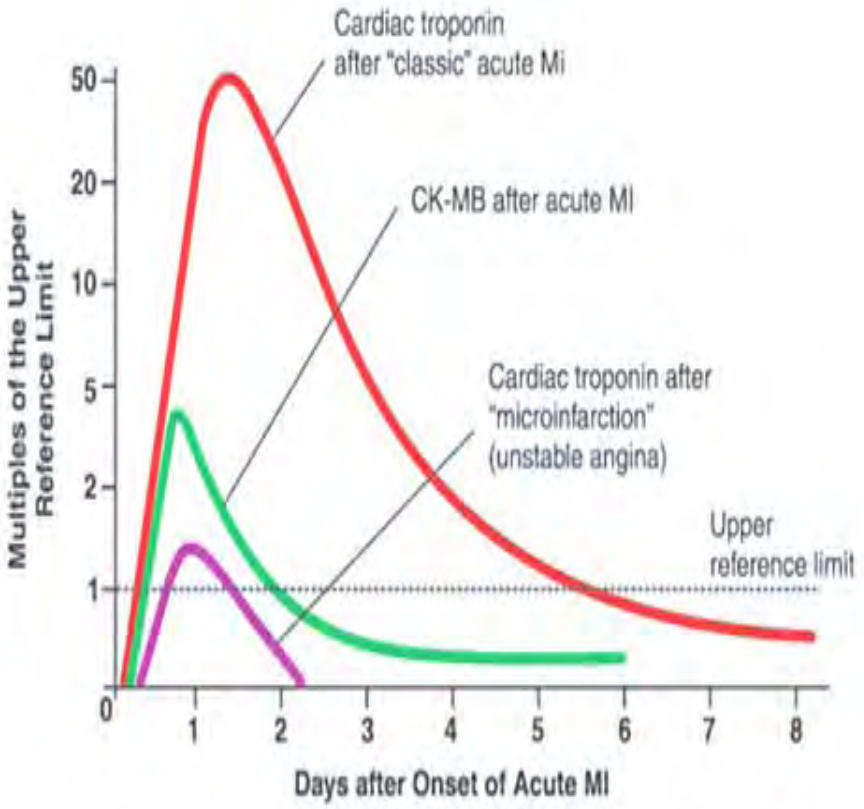






Cardiac Biomarkers





Risk Factors

Modifiable Risk Factors

- Smoking
- Poor diet
- High cholesterol
- Physical inactivity
- High blood pressure
- Overweight
- Depression or social isolation

Non-modifiable Risk Factors

- Gender
- Age
- Family history of CVD
- Diabetes
- Human immunodeficiency virus (HIV)

Complications

- Cardiogenic Shock
- Heart Failure
- Valvular Dysfunction
- Tachyarrhythmias
- Bradycardia
- Heart Block
- Pericarditis
- Stroke
- Venous Thromboembolism
- Recurrent Ischemia & Infarction

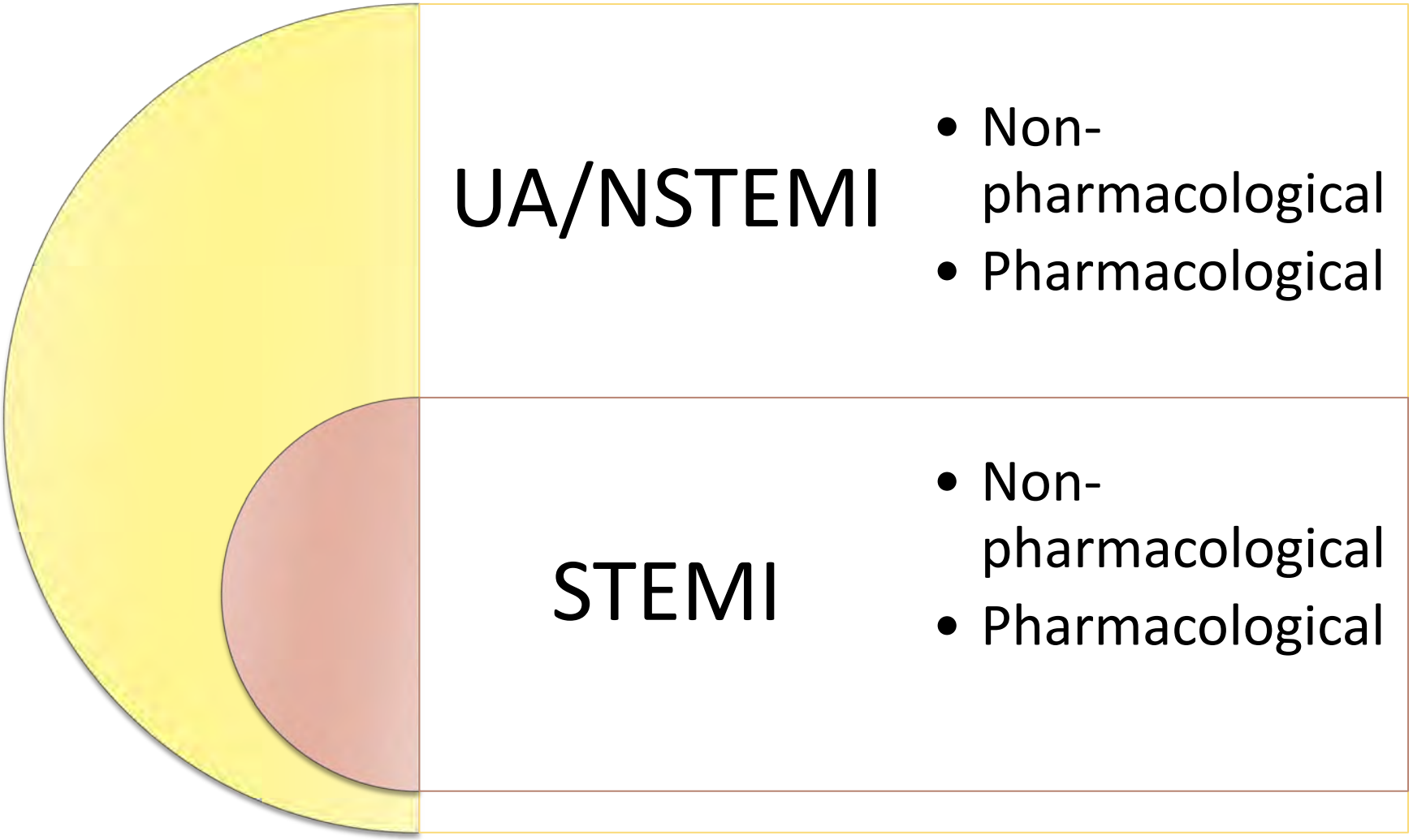
Evidence Based Medicine

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	SIZE OF TREATMENT EFFECT: CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/ administered	CLASS IIa *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	CLASS IIb *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	CLASS III *No Benefit* or CLASS III *Harm* Procedure/ Test / Treatment COR III: No benefit — Not Helpful — No Proven Benefit COR III: Harm — Excess Cost w/o Benefit or Harmful — Harmful to Patients
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	■ Recommendation that procedure or treatment is useful/effective ■ Sufficient evidence from multiple randomized trials or meta-analyses	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is useful/effective ■ Evidence from single randomized trial or nonrandomized studies	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	■ Recommendation that procedure or treatment is useful/effective ■ Only expert opinion, case studies, or standard of care	■ Recommendation in favor of treatment or procedure being useful/effective ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation's usefulness/efficacy less well established ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Only expert opinion, case studies, or standard of care
Suggested phrases for writing recommendations	should is recommended is indicated is useful/effective/beneficial	is reasonable can be useful/effective/beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown/unclear/uncertain or not well established	COR III: No Benefit is not recommended is not indicated should not be performed/ administered/ other is not useful/ beneficial/ effective COR III: Harm potentially harmful causes harm associated with excess morbidity/mortality should not be performed/ administered/ other
Comparative effectiveness phrases†	treatment/strategy A is recommended/indicated in preference to treatment B treatment A should be chosen over treatment B	treatment/strategy A is probably recommended/indicated in preference to treatment B it is reasonable to choose treatment A over treatment B		

Goals of Therapy

- Early restoration of blood flow to the infarct-related artery
- Prevention of death and other complications
- Prevention of coronary artery reocclusion
- Relief of ischemic chest discomfort
- Maintenance of normoglycemia

Treatment


UA/NSTEMI
• Non-pharmacological
• Pharmacological
STEMI
• Non-pharmacological
• Pharmacological

NSTEMI/UA

NSTEMI & UA – Risk Assessment Tools

TIMI: Thrombolysis in Myocardial Infarction

- Percent risk of all-cause mortality at 14 days in NSTE-ACS and at 30 days in STEMI-ACS
- Risk score determined by sum of presence of 7 variables at admission (1 point each)

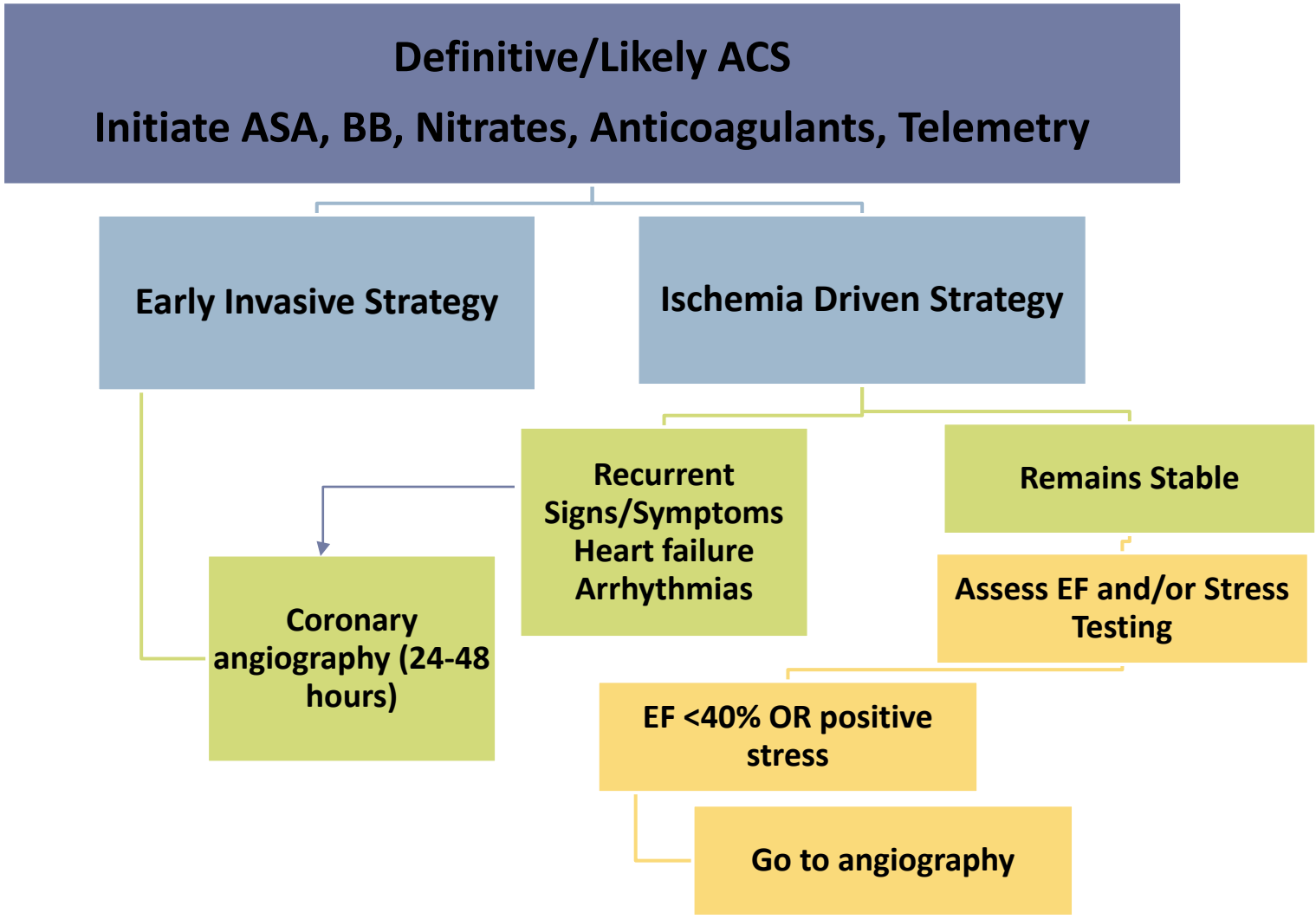
1. Age ≥ 65 years
2. ≥ 3 CAD Risk Factors (HTN, hyperlipidemia, DM, smoker, family hx of early MI)
3. Prior stenosis > 50%
4. ST deviation
5. ≥ 2 Anginal events ≤ 24 hrs
6. ASA in last 7 days
7. Elevated cardiac biomarkers

GRACE: Global Registry of Acute Coronary Events

- Predicts in-hospital and 6 month mortality across ACS patients

Risk Category (tertile)	GRACE risk score	In-hospital death (%)
Low	**≤ 108**	**< 1**
Intermediate	**109 – 140**	**1 – 3**
High	**> 140**	**> 3**
Risk Category (tertile)	**GRACE risk score**	**Post-discharge to 6 month death (%)**
Low	≤ 88	< 3
Intermediate	89 – 118	3 – 8
High	> 118	> 8

NSTEMI/UA
Early Invasive vs. Conservative Strategies



NSTEMI/UA
Management of ACS

Anti-ischemic Therapy	Antiplatelet Therapy	Anticoagulant Therapy	Disease Modifying Therapy
Morphine	Aspirin	UFH	Statin
Oxygen	P2Y12 inhibitor	Enoxaparin	ACE inhibitor
Nitroglycerin	GP IIb/IIIa Inhibitors	Fondaparinux	
β-blocker		Bivalirudin	

NSTEMI/UA
Anti-ischemic Therapy (Initial)

MONA + Beta Blocker		
	Dose	Comments
Morphine	5 mg IV q 5 min if symptoms not relieved by NTG	
Oxygen	If SaO_2 < 90% or hypoxia	
Nitroglycerin	0.4 mg spray or SL q 5 min x ≤ 3 doses 5 – 10 mcg/min IV	**CI:** Sildenafil/Vardenafil (w/in 24 hrs); Tadalafil (w/in 48 hrs)
Aspirin	162 – 325 mg **chew** and swallow **non-enteric coated**	**Reduce mortality** Clopidogrel if ASA allergy or GI intolerance
Beta Blocker	PO/IV initiated within 24 hours if eligible PO preferred	**Reduce mortality** Avoid if signs of HF or CI

NSTEMI/UA
Dual Antiplatelet Therapy (DAPT)

	LD (PO)	MD (PO)
Aspirin	162 – 325 mg non-enteric coated	81 – 162 mg daily indefinitely

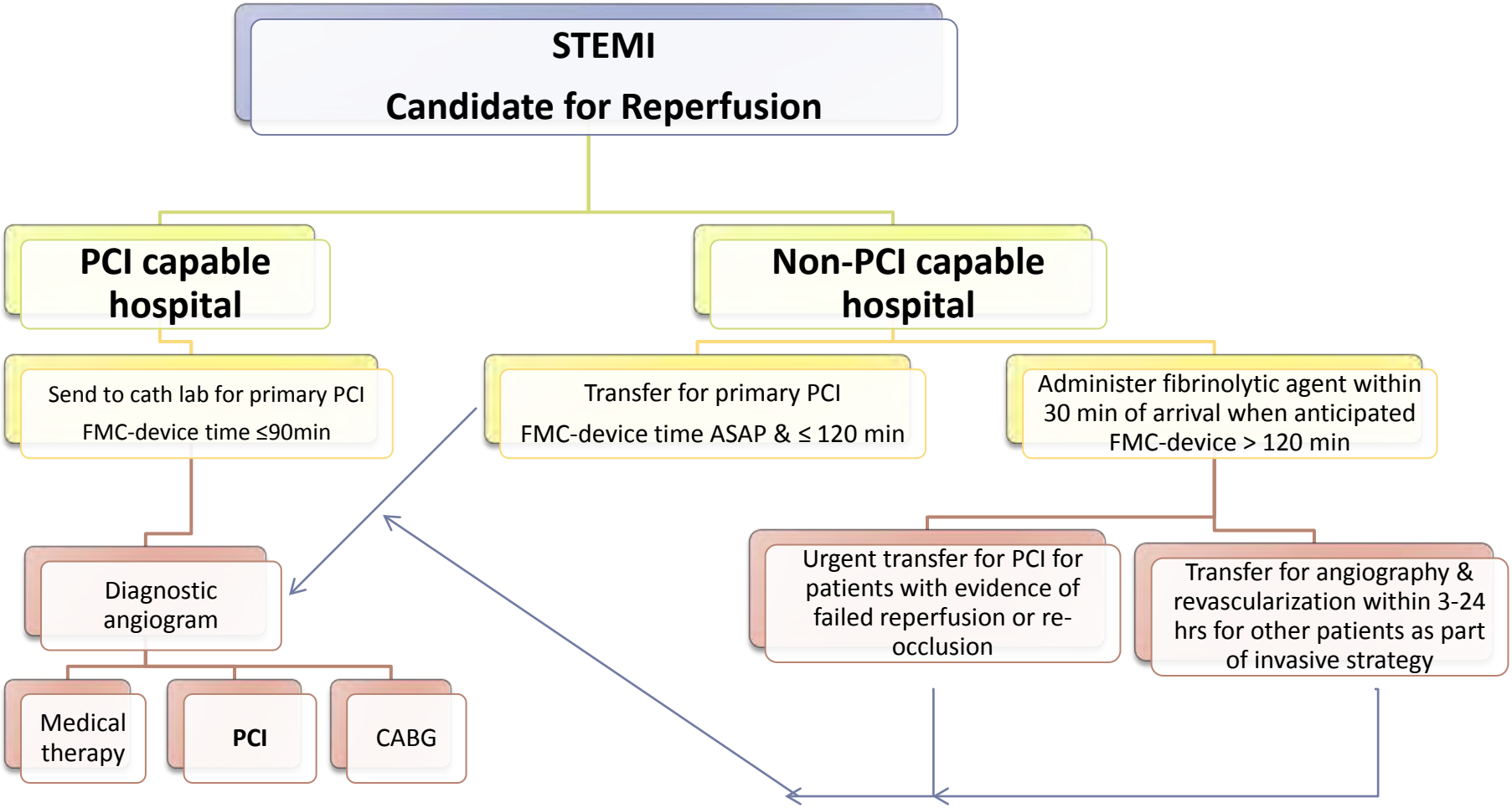
P2Y12 Inhibitors	FDA Indication	LD (PO)	MD (PO)	Comments
Clopidogrel	ACS managed medically or PCI	Ischemia: 300 mg PCI: 600 mg	75 mg QD	Best if patient can't drink full glass of water
Ticagrelor	ACS managed medically or PCI	180 mg	90 mg BID	CI: ICH; severe hepatic disease ASA MD 81 mg daily
Prasugrel	ACS PCI	60 mg	10 mg QD	Avoid in Hx of TIA or stroke; > 75 y; <60 kg

DAPT for at least 12 months

LD: Loading Dose; MD: Maintenance Dose; PO: Orally

STEMI

STEMI
Reperfusion Therapy



FMC: First Medical Contact

STEMI
DAPT with Primary PCI

	LD (PO)	MD (PO)
Aspirin	162 – 325 mg prior to procedure	81 – 325 mg daily indefinitely

P2Y12 Inhibitors	LD (PO)	MD (PO)	Comments
Clopidogrel	PCI: 600 mg	75 mg QD	Best if patient can't drink full glass of water
Ticagrelor	180 mg	90 mg BID	CI: ICH; severe hepatic disease ASA MD 81 mg daily
Prasugrel	60 mg	10 mg QD	Avoid in Hx of TIA or stroke; > 75 y; <60 kg

ICH: Intracranial Hemorrhage

STEMI
Management of ACS

Anti-ischemic Therapy	Antiplatelet Therapy	Fibrinolytics	Anticoagulant Therapy	Disease Modifying Therapy
Morphine	Aspirin	Alteplase	UFH	Statin
Oxygen	P2Y12 inhibitor	Reteplase	Enoxaparin	
Nitroglycerin		Tenecteplase	Fondaparinux	ACE inhibitor
β-blocker	GP IIb/IIIa Inhibitors	Urokinase; Prourokinase; anistreplase; Streptokinase	Bivalirudin	

STEMI
Percutaneous Coronary Intervention (PCI)

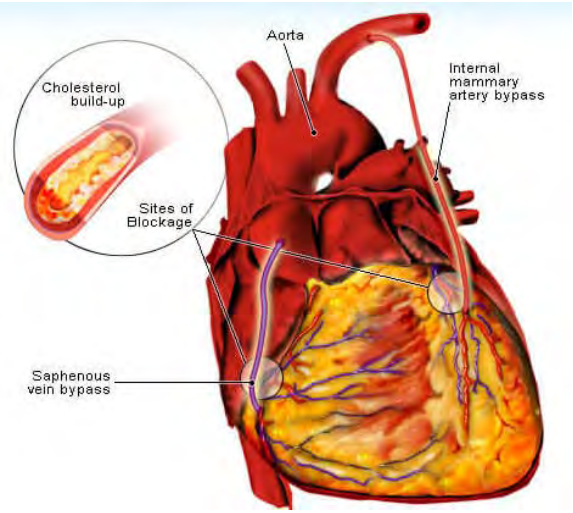
Balloon angioplasty alone

Balloon angioplasty with stents

- Bare metal stent (BMS)
- Drug eluting stent (DES)
  - Anti-proliferative agents: Sacrolimus, Paclitaxel, Everolimus, Zotarolimus

STEMI
Coronary Artery Bypass Graft

- Who?
  - Left main disease >50%
  - 3 (major) vessel disease >70%
- Advantages
  - Bypass occluded vessel completely
- Disadvantages
  - Invasive
  - Infection



Stop P2Y12 inhibitors

- Prasugrel ➔ 7 days prior to surgery
- Clopidogrel and Ticagrelor ➔ 5 days prior to surgery

Aspirin

- Give before CABG surgery

ACS
Discharge Medications

Oral Antiplatelet Therapy

- **Aspirin**
- P2Y12 inhibitor + ASA **x ≥ 12 months**
  - **Clopidogrel**
  - **Ticagrelor** (Take low dose aspirin / Dyspnea is transient)
  - **Prasugrel (option for BMS or DES)**

Nitrates

- **Glyceryl trinitrate, Nitroglycerin, Isosorbide dinitrate, Isosorbide mononitrate, Amyl nitrite**
- Topical or Oral

ACS
Discharge Medications

Beta Blockers

- **DECREASE MORTALITY**
- **Metoprolol, Atenolol, Propranolol**

ACE Inhibitors

- **DECREASE MORTALITY**
- ACEI: **Captopril, Enalapril, Ramipril, Lisinopril, Fosinopril, Perindopril, Quinapril, Cilazapril, Trandolapril, Zofenopril, Imidapril**
- ARB (if intolerant): **Losartan, Candesartan, Irbesartan, Telmisartan, Valsartan, Eprosartan, Olmesartan**
- CHF, EF < 40%, HTN, DM, stable CKD

Aldosterone Antagonist

- **DECREASE MORTALITY**
- **Spironolactone, Eplerenone**
- On ACE-I and beta blocker with EF<40%, Sx HF or DM & if CrCl>30 ml/min and K ≤ 5 mEq/L

ACS
Discharge Medications

Calcium Channel Blocker

- **Verapamil, Diltiazem**
- For ischemic symptoms when beta blocker not successful, CI, or intolerant

Statins

- **DECREASE ASCVD**
- **Rosuvastatin & Atorvastatin**
- High intensity

Non-steroidal Anti-inflammatory Drugs

- (Except Aspirin) Should **NOT** be initiated and should be discontinued during hospitalization

Role of Pharmacist

Medication Reconciliation

Review each medication to ensure it is

- Appropriate
- Effective
- Safe
- Convenient

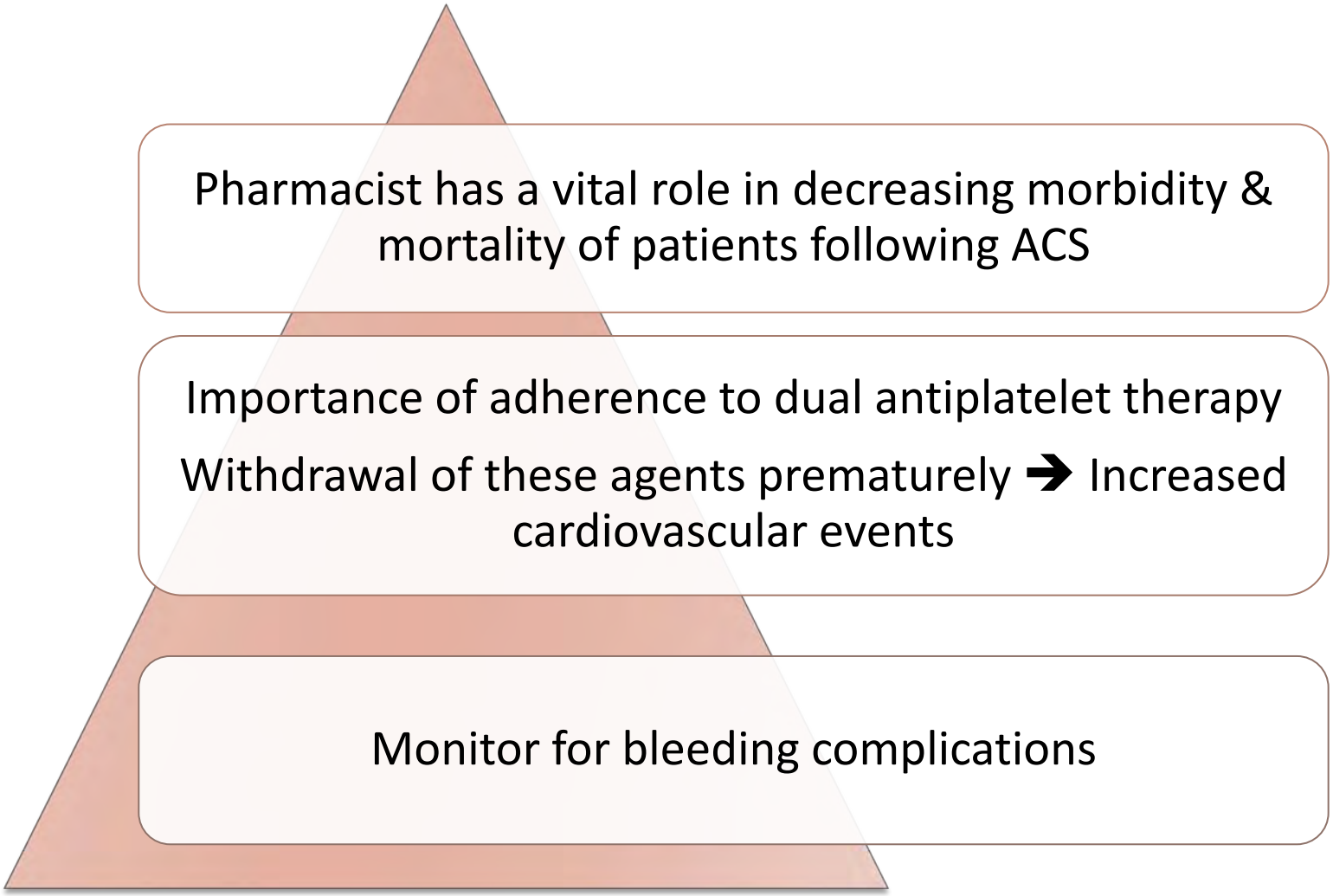
When

- On admission to the hospital
- During intra-hospital transition of care from unit to unit
- Upon discharge
- When prescriptions are filled/refilled

Initiate discussions surrounding

- Adherence importance
- Reason for taking medications
- Dose
- Timing

Key Takeaways



Key Takeaways

Emphasize the importance of secondary preventive measures

- **Lipids**
- **Blood pressure**
- **Weight**
- **Diabetes**
- **Exercise**
- **Influenza vaccine**

ACS CASE SCENARIOS

ACS – Case Scenario 1

- G.T. is a 66-year-old woman with a medical history of HTN, stable angina, and DMII. She had a myocardial infarction (MI) 2 years ago that was treated successfully with one bare metal stent (BMS) placed in the circumflex artery. During this follow-up visit, she states that her exertional chest pain episodes are controlled and rarely occur. G.T. has been able to resume all of her daily activities. Currently, she adheres to her diet and exercise regimen. Current drugs include aspirin 81 mg daily, clopidogrel 75 mg daily, bisoprolol 5 mg daily, amlodipine 5 mg daily, metformin 850 mg bid, and SL NTG as needed for chest pain. Today, her blood pressure is 134/84 mm Hg, and her pulse rate is 58 beats/minute. Laboratory values include K^+ 4.0 mEq/L, SCr 1.0 mg/dL, and HgB A1C 7.1%.

Which one of the following recommendations is most likely to improve G.T.'s survival?

A. **Increase bisoprolol to 10 mg daily**
B. **Increase amlodipine to 10 mg daily**
C. **Initiate ramipril 10 mg daily**
D. **Initiate ranolazine 500 mg twice daily**
E. **Switch bisoprolol to propranolol 40 mg qd**

Which one of the following changes is best to make to G.T.'s antiplatelet regimen?

A. **Discontinue clopidogrel**
B. **Increase aspirin to 325 mg daily**
C. **Increase clopidogrel to 150 mg daily**
D. **Add cilostazol 100 mg twice daily**
E. **Switch clopidogrel to ticagrelor 90 mg bid**

ACS – Case Scenario 2

- A 78 year old, 85-kg man (SCr: 1.2 mg/dl, estimated CrCl of 75 ml/min) was playing cards with his friends in a small town in Bekaa region when he developed sudden, crushing pain in his chest, radiating to his shoulder blades associated with severe dyspnea and shortness of breath. He had no previous medical history of significance, a non-smoker and non-drinker. Ambulance was called for by one of his friends and took him to the nearest and only non-PCI capable hospital in the region. No first aid was administered. Vital signs show a HR of 100 beats/min, RR of 25 breaths/min, Temp of 36.7°C, and BP of 158/87 mmHg. ECG shows an ST elevation and troponin was highly elevated.

In the emergency department, the patient should be directly treated by which of the following?

A. O_2, po morphine, 81 mg of enteric coated aspirin and SL NTG
B. O_2, po morphine, 325 mg of enteric-coated aspirin and SL NTG
C. O_2, IV morphine, 325 mg of non-enteric coated aspirin and SL NTG
D. O_2, SL morphine, 81 mg of non-enteric coated aspirin and SL NTG
E. O_2, IV morphine, bisoprolol, and IV nitroglycerin

ACS – Case Scenario 3

- SK is a 50 year old male who presents to the emergency department with chest discomfort radiating to his left shoulder and jaw. An ECG was performed and the patient was diagnosed with STEMI. He was directly transferred to perform a PCI. Post PCI, SK was started on ticagrelor 90 mg bid.

A paclitaxel-eluting stent was placed during PCI. The optimal duration of treatment with the P2Y12 receptor inhibitor is:

A. At least 1 month
B. At least 3 months
C. At least 6 months
D. At least 1 year
E. Indefinitely

Which of the following is the recommended dose of aspirin to be given to SK as maintenance?

A. 81 mg daily
B. 100 mg daily
C. 162 mg daily
D. 325 mg daily
E. 81 mg bid

For how much time should SK take aspirin?

A. For 1 year
B. For 1 month
C. For 6 months
D. For 3 years
E. Indefinitely

Thank you…

Heart Failure

OPL Patient Profile CE Program – 2017

Learning Objectives

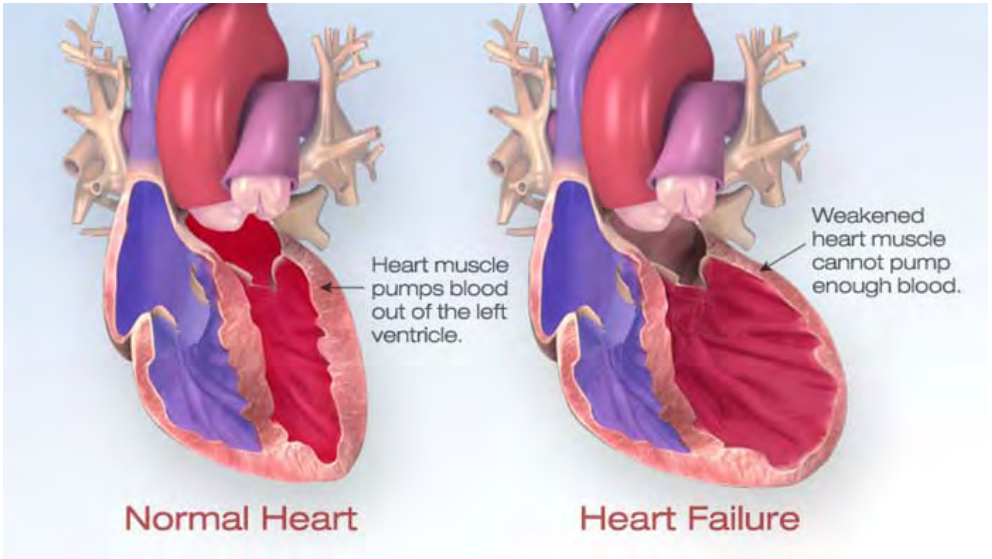
- Update current knowledge on Heart Failure therapeutic guidelines
- Provide a proper counseling for Heart Failure patients and patients at risk

Overview of Heart Failure (HF)

- Definition
- Cardinal Manifestations
- Diagnosis
- Classification
- Epidemiology

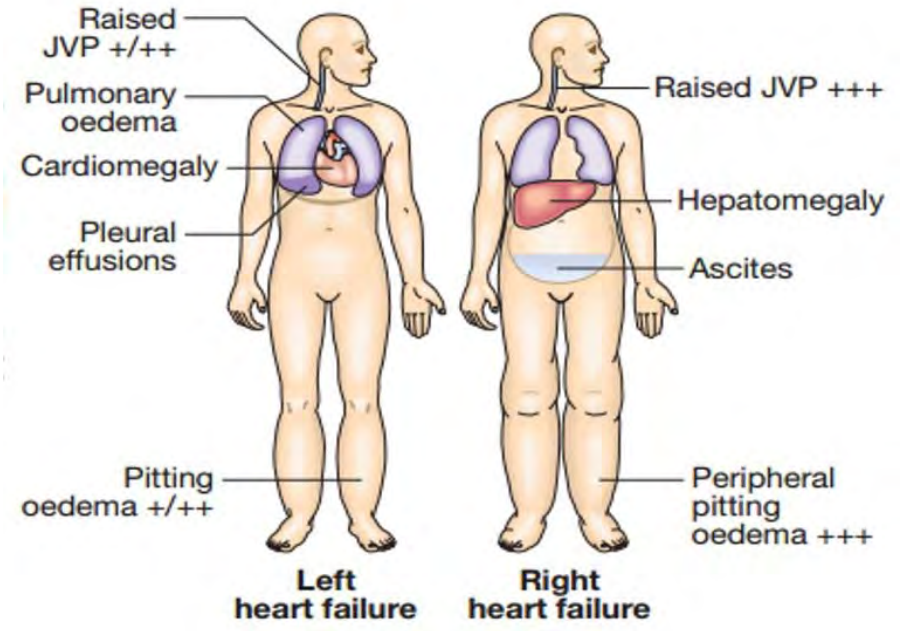
Overview of HF

- **Definition**
  - HF is a complex clinical syndrome
  - Results from any structural or functional impairment of ventricular filling or ejection of blood



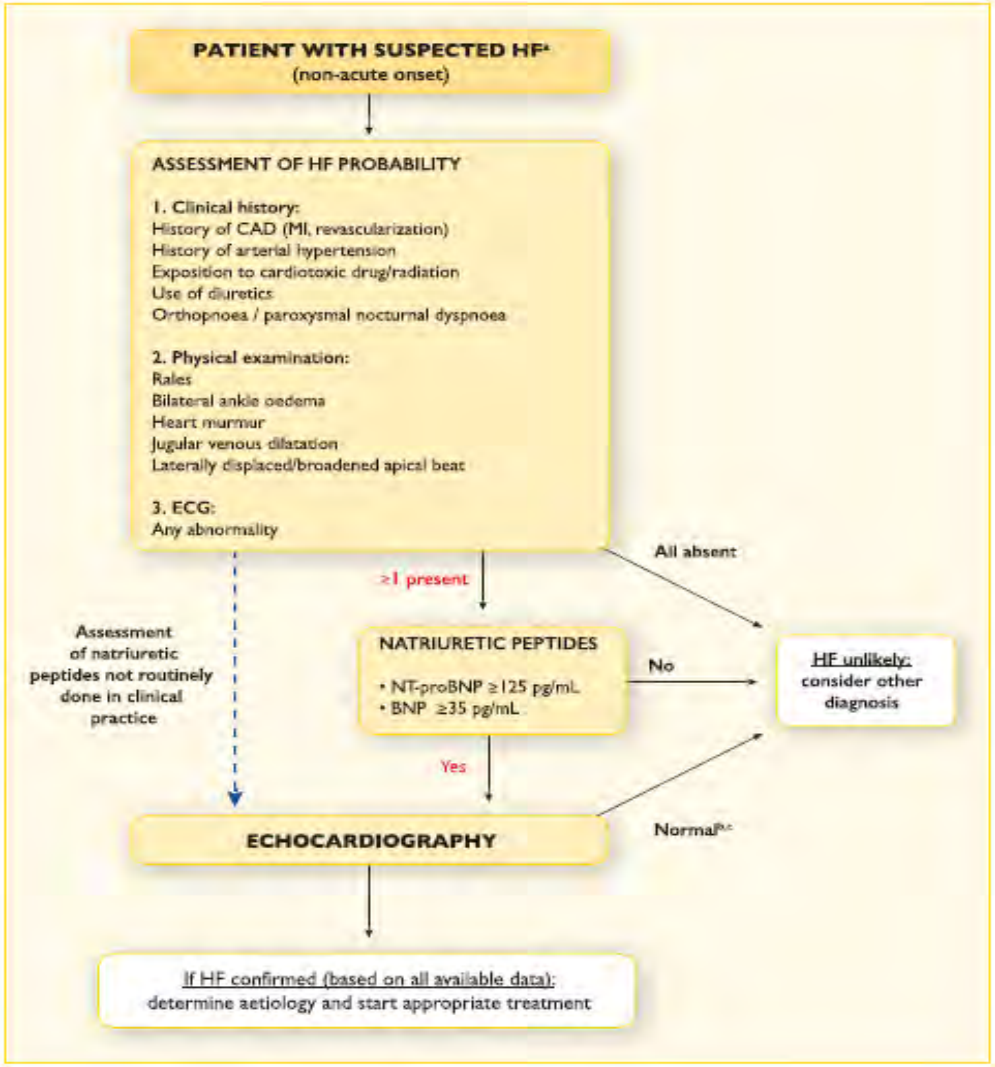
Overview of HF

- **Cardinal Manifestations**
  - Dyspnea and fatigue ➔ may limit exercise tolerance
  - Fluid retention ➔ may then lead to pulmonary congestion and peripheral edema



Overview of HF

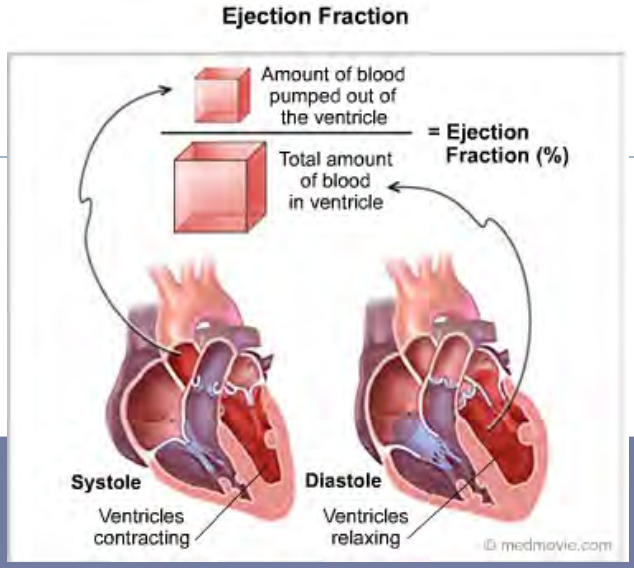
- Diagnostic Algorithm



2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Overview of HF

- Classification (1)



Classification basis	Description
Systolic HF	• Left ventricle loses its ability to contract normally • Left ventricular ejection fraction (LVEF) is reduced
Diastolic HF	• Left ventricle loses its ability to relax normally because the muscle has become stiff • LVEF is preserved or normal

Overview of HF

- Classification (2)

Classification basis	Description
HF with reduced ejection fraction (HF-REF)	• LVEF ≤ 40%
HF with preserved ejection fraction (HF-PEF)	• LVEF ≥ 50%

Overview of HF

- **Classification (3)**

Classification basis *NYHA Functional classification*	Description
I	• No limitation of physical activity
II	• Slight limitation of physical activity • Comfortable at rest
III	• Marked limitation of physical activity • Comfortable at rest
IV	• Unable to carry on any physical activity without discomfort • Symptoms present at rest

Overview of HF

- Classification (4)

Classification basis *ACC / AHA stage classification*	Description
A	• At high risk for HF • No identified structural or functional abnormality • No signs or symptoms
B *(NYHA I)*	• Structural heart disease but without signs or symptoms of HF
C *(NYHA I-IV)*	• Structural heart disease with prior or current signs or symptoms of HF
D *(NYHA IV)*	• Advanced structural heart disease and marked symptoms of HF at rest despite maximal medical therapy • Refractory HF requiring specialized interventions

Overview of HF

Epidemiology

- People affected worldwide ≈23 million

Causes

- Ischemic heart disease (most common)
- Others: dilated, familial, diabetic, and toxic cardiomyopathies

Risk factors

- Hypertension
- Diabetes
- Metabolic syndrome
- Atherosclerotic diseases

Focus of current guidelines on HF management
➔ HF-REF ≥ 50% of HF cases

Bui, A.L., T.B. Horwich, and G.C. Fonarow, Epidemiology and risk profile of heart failure. Nat Rev Cardiol, 2011. 8(1): p. 30–41.

Drugs for HF

Drugs for HF

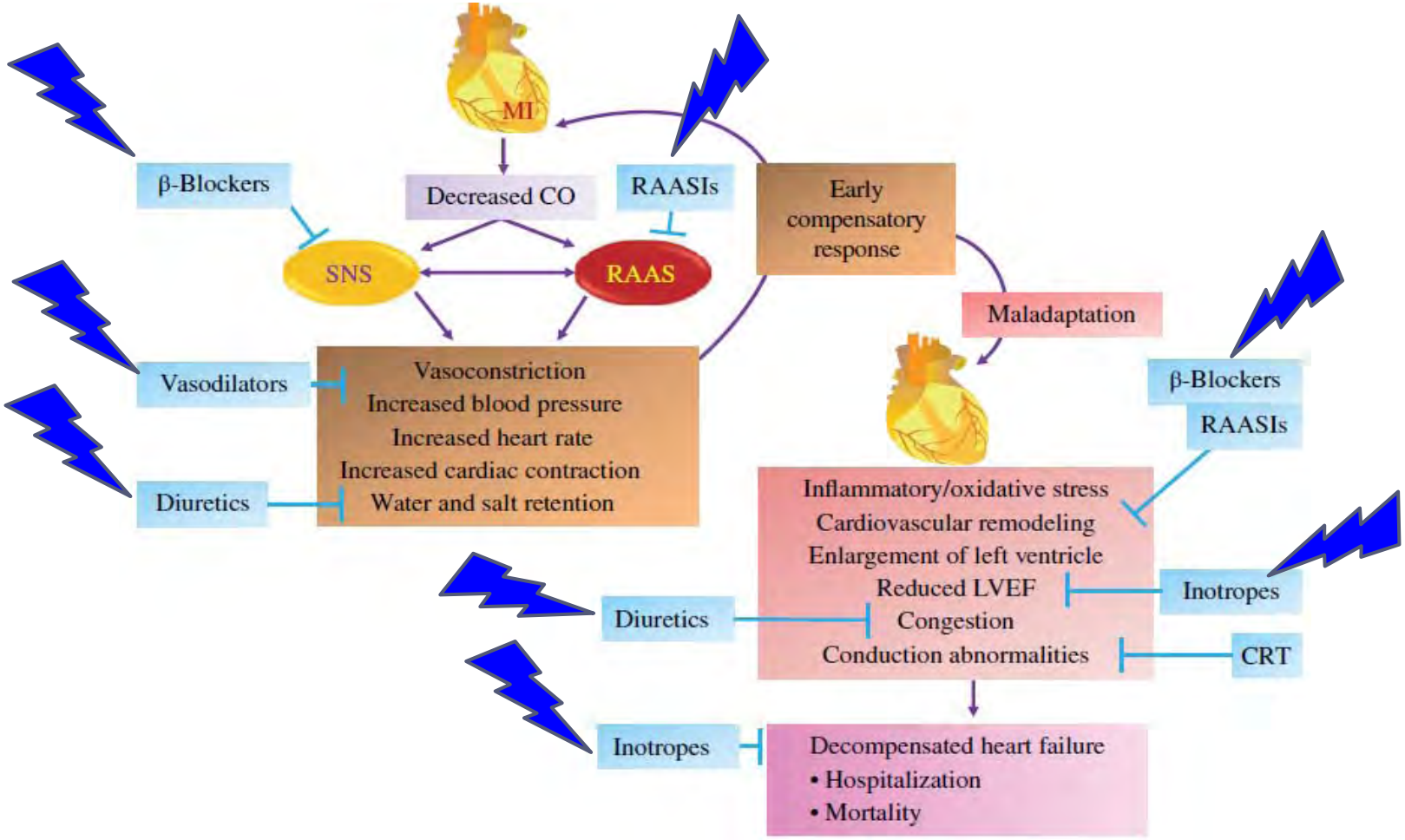


Figure showing the pathophysiology of HF-REF and drug targeting mechanisms

Y. Robert Li- Cardiovascular Diseases: From Molecular Pharmacology to Evidence-Based Therapeutics – Wiley 2015

Diuretics

Loop diuretics

- **Bumetanide, Furosemide, Torsemide**
- Most potent and preferred

Thiazide diuretics

- **Chlorthalidone, Hydrochlorothiazide, Indapamide**
- Considered in HTN + HF + mild fluid retention

Potassium-sparing diuretics

- **Eplerenone, Spironolactone**
- Not used for the purpose of diuresis
- Slow disease progression
- Reduce mortality

Beta-blockers

Metoprolol, Bisoprolol, Carvedilol

- Low dose as tolerated unless CI
- Long-term treatment
  - Lessen symptoms of systolic HF
  - Reduce risk of death
  - Reduce hospitalization

Angiotensin Converting Enzyme Inhibitors (ACEIs)

Captopril - Cilazapril - Enalapril - Fosinopril

Imidapril - Lisinopril - Perindopril - Quinapril

Ramipril - Trandolapril - Zofenopril

- Decrease risk of death
- Reduce hospitalization of patients
- Do not give if previous medication exposure related angioedema or pregnant
- If cannot tolerate ACEIs ➔ consider **ARBs**
  - **Candesartan, Eprosartan, Irbesartan, Losartan, Olmesartan, Telmisartan, Valsartan**

Aldosterone Receptor Antagonists

Spironolactone / Eplerenone

- Block aldosterone-mediated inflammation and cardiovascular remodeling
- Reduce all-cause deaths
- Reduce cardiovascular deaths
- Reduce hospitalizations

Vasodilators

Nitrates

- Glyceryl trinitrate
- Nitroglycerin
- Isosorbide dinitrate
- Isosorbide mononitrate
- Amyl nitrite

Hydralazine

Nesiritide (recombinant form of human B-type natriuretic peptide)

Most useful in patients with HTN

Positive Inotropic Agents

Digoxin

- Increase force and velocity of myocardial systolic contraction
- Decrease degree of activation of the sympathetic nervous system and RAAS
- Slow heart rate and decrease conduction velocity through AV node

Beta-adrenergic receptor agonists

- Dobutamine
- Dopamine

PDE3 inhibitors

- Inamrinone
- Milrinone

Emerging Drugs

Ivabradine

- Slows the heart through inhibition of the I_f channels in the sinus node
- Only used for patients in sinus rhythm

Angiotensin Receptor Neprilysin Inhibitor (ARNI)

- First in class is LCZ696: **Valsartan and Sacubitril**
- By inhibiting neprilysin ➔ Slow degradation of natriuretic peptides, bradykinin and other peptides
- Enhance diuresis, natriuresis, myocardial relaxation and anti-remodeling
- Withhold ACEI for at least 36 h before initiating ARNI

Management of HF

Stage A	Stage B	Stage C	Stage D

Principles & Guidelines

Stage A: Patient at risk but asymptomatic

- Identify risk factors
- Educate patient and family
- Treat HTN, dyslipidemia, diabetes, etc…
- Restriction of daily sodium intake to 1500 mg

Stage B: With structural remodeling but few symptoms

- ACEI
- Beta-blocker
- Statin
- Restriction of daily sodium intake to 1500 mg

Stage C: Structural disease, symptoms of failure

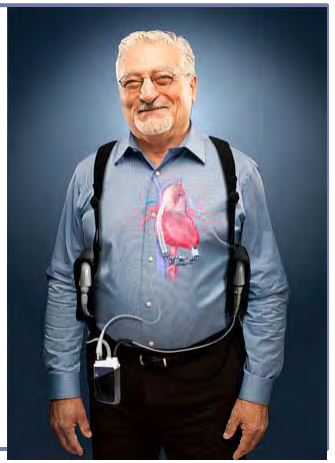
- ACEI
- Beta-Blocker
- Add diuretics or digoxin
- Add aldosterone antagonist
- Sodium restriction (eg, <3 g/d)
- Exercise training (or regular physical activity)
  - **Recommended based on tolerance**

Stage D: Symptoms refractory to treatment

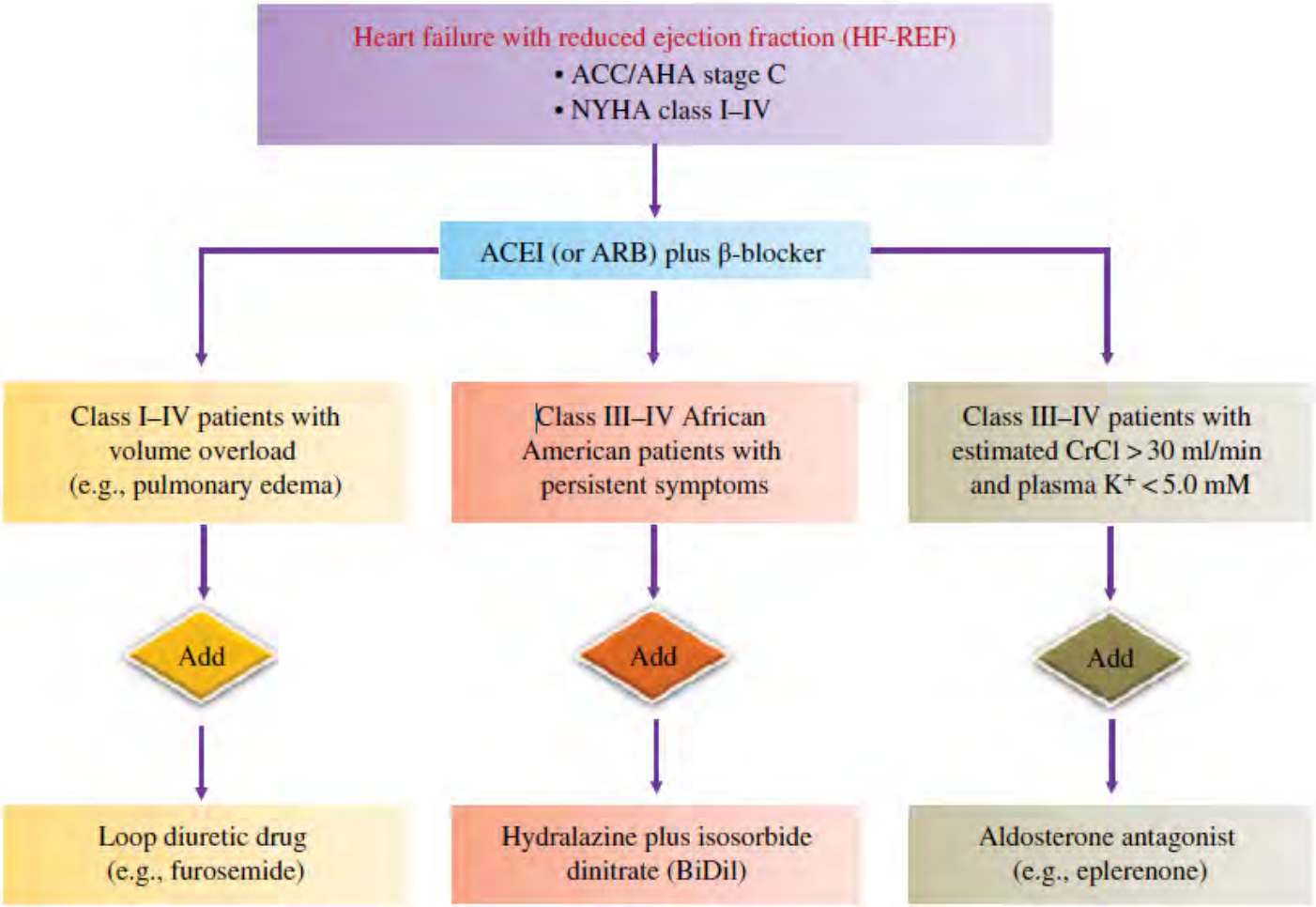
Use inotropic agents

Employ surgical interventions

- Ventricular assist device
- Heart transplant



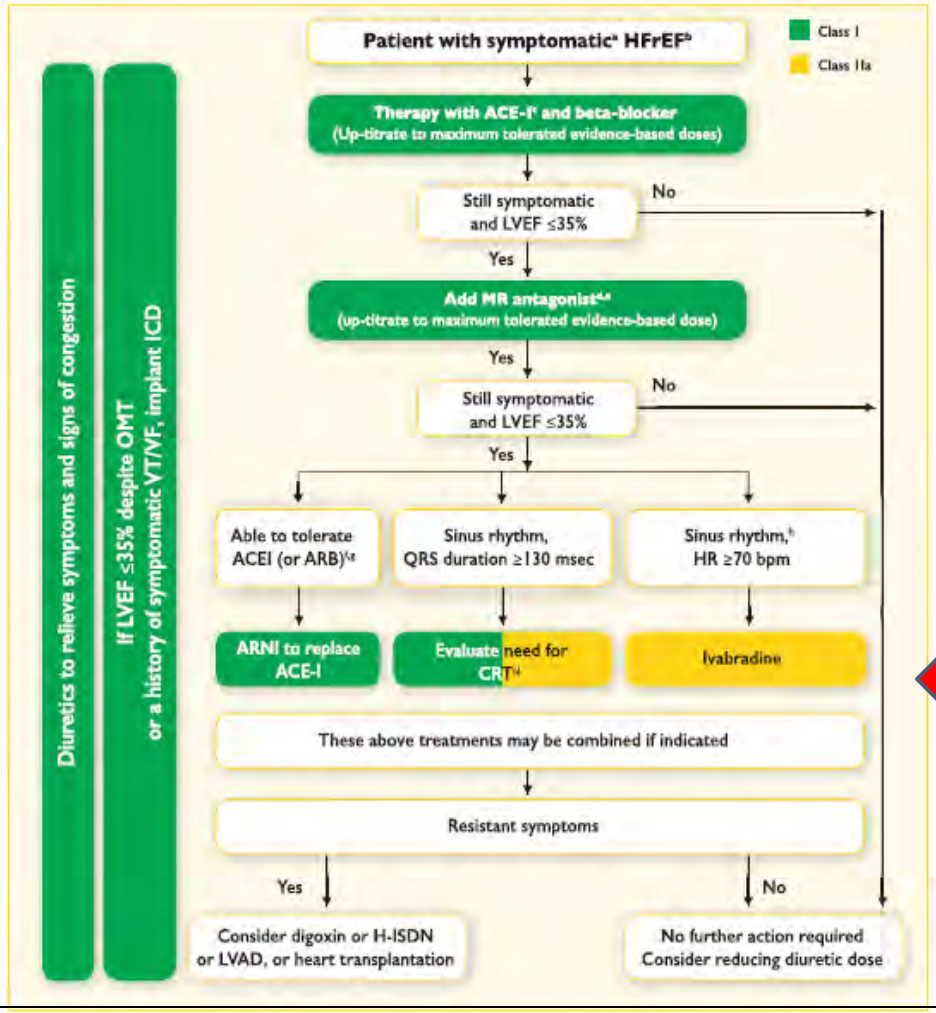
Principles and Guidelines



Flowchart illustration of the management of stage C HF-REF (2013 ACCF/AHA)

2013 ACCF/AHA guideline for the management of heart failure (figure with modifications)

Principles and Guidelines



ARNI / Ivabradine

Flowchart illustration of the management of stage C HF-REF (2016 ESC)

2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure
2016 ACC/AHA/HFSA Focused Update on the Management of Heart Failure

General Counseling

Explain HF to patients

- Heart is simply not able to pump the blood as well as it used to ➔ make exercise more difficult
- Avoid mentioning failure ➔ Replace by “congestion”

Patients’ complaints

- Increasingly breathless
- Ankle swelling

Purpose of drugs

- Reduce work of the heart
- Make heart beat more forcefully

General Counseling

- Avoid drugs that exacerbate HF
  - NSAIDs, corticosteroids, liquorice, lithium, products containing high Na+ levels (effervescent formulations, some antacid preparations)
    - **Na+ / water retention**
  - Tricyclic antidepressants
    - **Depress heart function / cardiac arrhythmias**
  - Beta-blockers in high doses
    - **Negative inotropic / chronotropic effects**

General Counseling

Precautions with OTC products!

Soluble preparations, indigestion remedies, cystitis treatment (Na+/K+)	Cough and cold remedies containing decongestants (pseudoephedrine)	NSAIDs	Laxatives (senna, lactulose)	Caffeine (analgesic preparation)

Specific Counseling

ACEIs

Pronounced first-dose hypotension!

- Take first doses immediately before retiring to bed at night

First-dose hypotension may be worse with diuretics

- Diuretic may be stopped for a few days before initiating ACEI

Discuss any cough with the GP

- Patients should be encouraged to persist with ACEI

Specific Counseling

Diuretics

Male patients

- Possible impotence as a side effect

Increase in urine flow, usually after 2h of taking the dose

- May subside after a couple of weeks

Take the diuretic in the morning to limit sleep disturbance

- If 2 daily doses are required ➔ May be taken at 7am and 1pm

Omit a dose during periods of diarrhea and vomiting

Sunscreen

- Avoid photosensitivity reactions

Specific Counseling

Digoxin

Narrow therapeutic index

- Body weight – Age – Renal function – Concomitant drugs

Report signs of toxicity

- Nausea – Vomiting – Diarrhea – Vision disturbances – Loss of appetite

May cause arrhythmias

- Report dizziness, an irregular heartbeat or palpitations

Drug interactions!!

- Potassium-depleting diuretics
- Calcium
- Quinidine, verapamil, amiodarone, propafenone, indomethacin, itraconazole, alprazolam and spironolactone (decrease clearance or Vd of digoxin)
- Macrolides and tetracycline (increase digoxin absorption)

Specific Counseling

Beta-blockers

Beneficial effects may not be immediate

- Symptoms may worsen

Male patients

- May experience impotence

Report any additional breathlessness

Cold extremities or peripheral weakness

- Reflect blockade of vasodilator beta2-adrenoceptors

Do not stop taking the tablets suddenly!

Specific Counseling

Nitrates

- Patients may experience a throbbing headache ➔ relieved with paracetamol

Spironolactone

- Male patients ➔ small risk of breast enlargement (gynecomastia) ➔ harmless

Monitoring

Renal function

- Before treatment (diuretics, digoxin, ACEI)
- After 2 weeks and after each dose change

Electrolytes

- K+ levels ➔ a week after starting diuretic treatment or adjusting treatment ➔ at least annually once the regimen is stabilized
- Na, Mg, Ca

Digoxin

- Plasma concentrations of digoxin ➔ at regular intervals (6-12h post-dosing)
- Monitor heart rate

Thank You…

HF CASE SCENARIOS

HF Case Scenario 1

- A 71 year old male comes to his physician complaining of severe shortness of breath at night and swelling of the ankles. He has reduced his activity over the past 6 months because of chest pain when he exerts himself. Physical examination reveals rales over both lungs, enlargement of the liver, and pitting edema of the ankles. Blood pressure is 140/90mmHg and heart rate is 95 bpm. His ECG is normal at rest. Cardiac enzymes and blood electrolytes are normal. Because the major immediate problem in this patient is HF, which of the following drug therapies should be initiated right away for his condition?

A. Atenolol and quinidine
B. Furosemide and Lisinopril
C. Nitroglycerin and spironolactone
D. Prazosin and losartan
E. Verapamil and digoxin

HF Case Scenario 2

- A 65 year old male is diagnosed with advanced chronic HF.

1. Which of the following drugs would be most likely prescribed to prolong his life?

A. Digoxin
B. Furosemide
C. Hydralazine
D. Nesiritide
E. Spironolactone

HF Case Scenario 2

2. What is the most likely mechanism of action for the chosen drug to prolong this patient's life?

A. Decreased cardiac remodeling
B. Decrease nitric oxide bioavailability
C. Increased diuresis
D. Inhibition of Na+/K+ ATPase
E. Positive inotropic effect

3. What specific counseling could you provide with this drug?

Thank You…