Acute Coronary Syndromes

UA	NSTEMI	STEMI
CP + CE – ECG +	CP + CE + ECG + (ST depress, T wave Δs)	CP + CE +/– (90 min door to balloon, may not have dmg) ECG + (ST elevation > 1 mm)
Risk factors → cath Stress test	Cath 12-24 hrs	Cath 90 min

Chest pain → atypical, typical (exertional, relief from SL nitro, shorter (min-hr), substernal, radiating left)
Cardiac enzymes → troponin, CK-MB
ECG changes → ST or T wave Δs

Therapeutic goals

UA/NSTEMI: prevent total occlusion, control chest pain and other symptoms

STEMI: restore patency of infacted artery, prevent complications (e.g. arrhythmias), control CP and Sx

	UA	NSTEMI	STEMI
Morphine 1-5 mg IV **O**xygen (if O_2 sat < 90%) **N**itroglycerin **A**spirin (chew 162-325 mg)	x	x	x
Beta blocker			x
Anticoagulation	x	x	x
Antiplatelet	x	x	x
IIb/IIIa	If PCI	If PCI	If PCI
Fibrinolysis			If no PCI

UA/NSTEMI

	Early invasive (PCI < 12 hr)	Delayed PCI (> 12 hrs)	Early conservative (no PCI)
Anticoagulant	UFH, enox, bival, fonda (+ UFH w/ PCI)	UFH, enox, bival, fonda (+ UFH w/ PCI)	Enox, fonda
Antiplatelet	Clopidogrel or prasugrel Abciximab or eptifib w/ PCI	Clopidogrel or prasugrel Eptifib or tirofib w/ PCI if high or moderate risk	Clopidogrel Abcix or eptifib w/ PCI if +stress test

STEMI	PCI (w/in 90 min)	Fibrinolysis (w/in 30 min, up to 12 hrs)
Anticoagulation	UFH w/ abciximab (or eptifib or tirofib) Bivalirudin alone	UFH 48 hrs or Enoxaparin 8 days or Fondaparinux 8 days
Antiplatelet	Clopidogrel or prasugrel	Clopidogrel

Dosing and duration of antiplatelet

	ASA	Clopidogrel/Prasugrel
Initial	162-325 mg chewed	CLO 300-600 mg LD (300 mg if w/ fibrinolytics)
Pre-PCI	75-325 mg	CLO 300-600 mg LD or PRA 60 mg LD
No stent	75-162 mg/day indefinitely	CLO 75 mg for 14 d to 1 yr
BMS DES	162-325 mg 1 month 3 mo (siro), 6 mo (paclitaxel) Then 75-162 mg/day infef.	CLO 75 mg/day or PRA 10 mg/day (5 mg if < 60 kg) for 12-15 mo

See Table 8, 9, 10 for IIb/IIIa, anticoagulants, thrombolytics**. See Table 11** for contraindications to thrombolytics.

Post ACS:

1. Beta blockers,
2. ACEi or ARB,
3. ASA + CLO or warfarin,
4. Statin (LDL < 70-100 mg/dL)

Peripheral Artery Disease: vascular insufficiencies in noncoronary arteries 2/2 atherosclerotic occlusions

a. Functional – due to spasms of vessels
b. Organic – structural changes e.g. fatty buildup

Symptoms: leg or hip pain, cold legs and feet, changes in skin color, pain reduced w/ resting, numbness or tingling

Ankle brachial index = ankle SBP ÷ arm SBP

1-1.29	Normal
0.91-0.99	Borderline
0.41-0.9	Mild to moderate
0-0.4	Severe

PAD risk factors

Age > 50	HTN
Smoking	↑ homocysteine
Diabetes	High sensitivity-CRP
HL	Male
Family Hx	

Treatment: reduce risk factors

Diet, exercise, smoking cessation, HL drugs (goal LDL < 70), antihypertensives (goal BP < 140/90 or 130/80 if diabetic), diabetes control (A_{1C} < 7%), homocysteine, folic acid and B_{12}, antiplatelet (ASA 75-325 or CLO 75)

Treatment of claudication: cilostazol 1st line, pentoxifylline 2nd line, IR for angioplasty or stents

Dyslipidemia

Fasting lipid panel (9-12 hrs)

LDL	< 100	Optimal
	100-129	Above optimal
	130-159	Borderline high
	160-189	High
	≥ 190	Very high
HDL	< 40	Low
	≥ 60	High
TC	< 200	Desirable
	200-239	Borderline high
	> 240	High
TG	< 150	Normal
	150-199	Borderline high
	200-499	High
	≥ 500	Very high

LDL goal

CHD risk equivalents: CHD (MI, CABG, PCI, ACS), atherosclerotic dx (PAD, AAA, carotid), DM, > 20% Framingham
Positive risk factors: smoking, HTN, low HDL, family Hx premature CHD (55m, 65w), Age (45m, 55w)
Negative risk factors: high HDL

Risk category	LDL goal	LDL to start Rx
CHD risk equiv, Fram > 20%	< 100 (optional < 70)	≥ 130, opt > 100 or < 100?
2+ risk factors, Fram 10-20%	< 130 (optional < 100)	≥ 130, opt > 100
2+ risk factors, Fram < 10%	< 130	≥ 160
0-1 risk factor	< 160	≥ 190, opt > 160

Non HDL goal = 30 + LDL goal

Lifestyle changes: weight loss, exercise, diet (plant sterols, soluble fiber, low cholestrol)

Low HDL: TG < 200, niacin safer combo w/ statins than fibrates, smoking cessation, exercise
TG 200-499 target non-HDL, TG > 500 target TG

High TG > 500: goal prevent pancreatitis
Low fat diet, fibrates or niacin, reduce TG before LDL

Pharmacotherapy

Statins (HMG-CoA reductase inhibitors)
↓ LDL 24-60%, ↓ TG 7-40%, ↑ HDL 5-15%. Reduce coronary events, CHD mortality, stroke, total mortality

AE: myopathy, elevated LFTs (check baseline, 3 month, yearly)

DI: SAL (simvastastin, atorvastatin, lovastatin) are CYP3A4. Fluva 2C9, Rosu 2C19, Pita 2C9. Avoid with inhibitors. Myopathy risk higher with gemfibrozil than fenofibrate. Niacin lower risk than fibrates (careful if > 1g/day).

Efficacy

	5 mg	10 mg	20 mg	40 mg	80 mg
Fluvastatin			24	30	36
Pravastatin		24	30	36	40
Lovastatin		24	30	36	40
Simvastatin	24	30	36	42	48
Atorvastatin		36	42	48	54
Rosuvastatin	42	48	54	60	

Pitavastatin (1 mg = 30%, 2 mg = 36%, 4 mg = 42%). About 6% with each dose doubling and rank.

Bile acid sequestrants – inhibits bile acid recirculation. Liver converts cholesterol to bile acid
↓ LDL 15-26%, ↑ HDL 3-6%, reduce coronary events and CHD mortality.
Names: cholestyramine, cholestipol, colesevelam

AE: GI distress, constipation, may increase TG.

DI: decreased absorption of drugs (e.g. warfarin, BB, thiazides)

Niacin – inhibits mobilization of FFA from perif adipose tissue, reduces VLDL synthesis
↓ LDL 15-26%, ↓ TG 20-50%, ↑ HDL 15-26%, reduces coronary events, possibly reduces mortality
Formulations: IR Niacin, ER Niaspan, SR Slo-Niacin

AE: flushing, hyperglycemia, hyperuricemia, GI distress, hepatotoxicity (check LFTs base, q6-12wks, yearly)
Sustained release more hepatotoxic, less flushing (can give ASA 30 min prior to reduce flushing)

Fibrates – reduce lipogenesis in liver
↓ LDL 5-20% (normal TG, may ↑ TG up to 45% w/ high TG), ↓ TG 30-55%, ↑ HDL 18-22%, reduce coronary events and progression of coronary lesions
Names: gemfibrozil, fenofibrate

AE: dyspepsia, gallstones, myopathy, ↑ LFTs (check q3mo for 1st year, then yearly)

Ezetimibe – inhibits cholesterol absorption. Adjunct with statins.
↓ LDL 18-20%, ↓ TG 7-17%, may ↑ HDL 1-5%

AE: HA, rash

Omega-3 (Lovasa) – unknown mechanism
(may ↑ LDL up to 45% w/ high TG), ↓ TG 26-45%, may ↑ HDL 11-14%

AE: GI (burping, dyspepsia), inhibit plt aggregation, bleeding