



ACS

Sept 2014

Definition

WHO of MI: 2 of: symptoms/typical ECG changes (Q/T wave)/incr biomarker

Other of MI: 1+ of: symptoms/new ECG changes (ST, T, Q, LBBB/new loss of myocardium or RWMA on echo and incr (over 99th percentile) trop +/- CKMB

STEMI: new STE in 2 leads (2mm in V1-3, 1mm elsewhere)

Established MI: any Q wave V1-3; Q waves >1mm tall >30ms wide in 2 leads elsewhere

Epidemiology

Incidence: 40% incr admission for ?ACS in past 15yrs; decr rates STEMI due to incr elective PTCA

Prevalence in ED: 20% ACS, 2.5% STEMI, 5% NSTEMI

Chest pain: present in 5% ED presentations; only 25% elderly have CP; 15-30% silent (esp in elderly, females, DM, prev CCF, prev CVA, psych, altered LOC) – assoc with double hospital mortality (10% vs 20%); 20% ACS describe pain as sharp, 5% as stabbing, 6% as pleuritic

Mortality: incr mortality if LBBB; 20% sudden death rate from CAD; 60% 10yr survival from CAD; 2% die before cardiac markers rise; 30% die prior to arrival to hospital; 12% overall death rate in hospital

Pathophysiology

CAD

CA spasm (young women, Asians, 85% have CAD, usually at rest/relieved by nitrates, cause STE)

Takotsubo's cardiomyopathy (transient apical ballooning syndrome, STE in ant leads, 80% female, post-menopause, due to SNS problem esp after severe stress, 1-3% early mortality, otherwise prognosis good)

ACS: sudden total/near total occlusion due to plaque rupture and thrombus formation; NSTEMI non-occlusion/brief occlusion/good collaterals; irreversible in 20-40mins; scarring complete in 2/12; gross necrotic changes in 4-12hrs; ATP decr by 50% in myocytes by 10mins

MI:
Dyssynchrony: dissociation of contraction of adjacent segments of myocardium
Hypokinesia: decr shortening with contraction - decr LV pump - incr LVEDP/LVESV - decr SV - incr LAP - CCF
Akinesia: no shortening
Dyskinesia: expansion during systole

Risk factors

In ED these are not useful in predicting MI; 1/3 of MI's occur in patients with no RF's; 10% elderly with acute confusion/falls/unexplained collapse have MI; <5% with STEMI have no CAD

Odds ratio for CAD: chol >5.5 2.5 > smoking 2 > HTN 1.5

Major: above 3, DM, age, FH

Other: male, obesity, sedentary lifestyle

Precipitants: infections, stress, unaccustomed exercise, stimulant use

Risk stratification

Factors: age, history, Sx, ECG, biomarkers, ETT, angio

If normal initial ECG and trop = 1% risk MI

If normal initial ECG and trop + no RF's, no PMH, <40yrs - 0.1-0.2% risk MI - suitable for discharge

10% low risk have cardiac event in hospital, 20% within 6/12; 30% reclassified as high risk after further evaluation

TIMI risk score:

1pt per: >65yrs, 3+ RF's, prev angio >50% obstruction, ST changes

2+ angina in 24hrs, aspirin, incr biomarkers



0-2 = low risk (1-8% risk adverse event in 2/52) = less benefit invasive trt

3-7 = high risk (13-40% risk adverse event 2/52) = early invasive trt good

Pros: not dependent on physiological variables; validated; applicable to all; good performance in short term

Cons: doesn't weight RF's; can't be used in decision making in ED; 0 score still has 2% adverse events; less accurate than Grace; uses subjective variables

GRACE score:

Age, HR, SBP, CRr, Killip class, Cardiac arrest, ST changes, Biomarkers

Pros: gives estimate of in-hospital and 6/12 mortality; more precise than TIMI

Cons: more difficult to do than TIMI; no history RF's involved

Prognosis

Mortality: 1% if initially normal ECG; 12% mortality in hospital

Factors: age, DM, other co-morbidities; 1yr prognosis better in cocaine users

High risk features: anterior location, multiple leads with STE, prominent STE, reciprocal ST depression (5% mortality), TWI (1.5% mortality), incr HR, long QRS, Q waves on presentation, CHB (75% mortality if with ant MI), RBBB, CCF (20% if creps, 40% if APO, 80% if shock); 10% will have significant cardiac event within 1/52

Assessment

Positive LR's of ACS:

20 = STE

7 = radiation both arms

6 = new conduction defect

4 = Q waves, ST depression

3 = 3rd HS, decr BP, radiation R shoulder

2.5 = radiation L arm

2 = creps, sweating, CP prominent, N+V

1.5 = prev MI

80% sens, 50% spec for ACS: clenched fist (Levine's sign), flat hand, palms laterally from centre of chest

Negative LR's for ACS:

0.2 = pleuritic CP, reproducible on palpation, normal ECG

0.3 = sharp pain, positional

Less likely if: constant unremitting pain 12-24hrs

Can exclude ACS in >95% if all of: <40yrs, no PMH CAD, no DM, non-oppressive/retrosternal

Not useful: response to nitrates (72% sens, 37% spec); response to antacids (in 33%)

OE: chest wall tenderness in 15% MI's

Flow:

ECG +ive / trop +ive - admit, treat

ECG -ive, trop -ive - repeat trop/ECG at 12hrs +ive - trt, -ive - ETT -ive - V low risk

ECG

Do within 5mins, interpret within 10mins; repeat after 30mins if no chest pain, Q15minly if chest pain; repeat if pain returns or condition changes; 15% with initial normal ECG's develop criteria on serials (35% in 0-8hrs, 20% in 8-12hrs, 40% in 12-48hrs)

Accuracy of ECG interpretation in ED: >95% sens, 85% spec

1. 2-30 mins:

Hyperacute T wave: due to rapid repolarisation of infarcted muscles

Lasts for <30mins; ischaemia reversible while present

Asymmetric, broad based

Also: J point usually elevated, may be depressed

2. 20 mins (max at 12hrs)

ST elevation: due to rapid repolarisation/delayed depolarisation of infarcted muscles, decline in RMP

LR 20, PPV >90% for MI; in 2 leads, 50% sens, 97% spec

Incr sens with serials; 10% incr sens if do RV/posterior leads

Only present in 35% if circumflex

Other causes of STE: BER, pericarditis, LV aneurysm (concave initial portion, Q waves in same leads as STE, no R waves);

LVH, LBBB, Brugada

3. 1 -12 hours:

Q wave: Due to electrical silence of dead muscle; don't equate to transmural MI, no significant difference in degree of occlusion or rate of reinfarction

LR 4 for MI; in 85% MI's; 50% STEMI's at 1hr

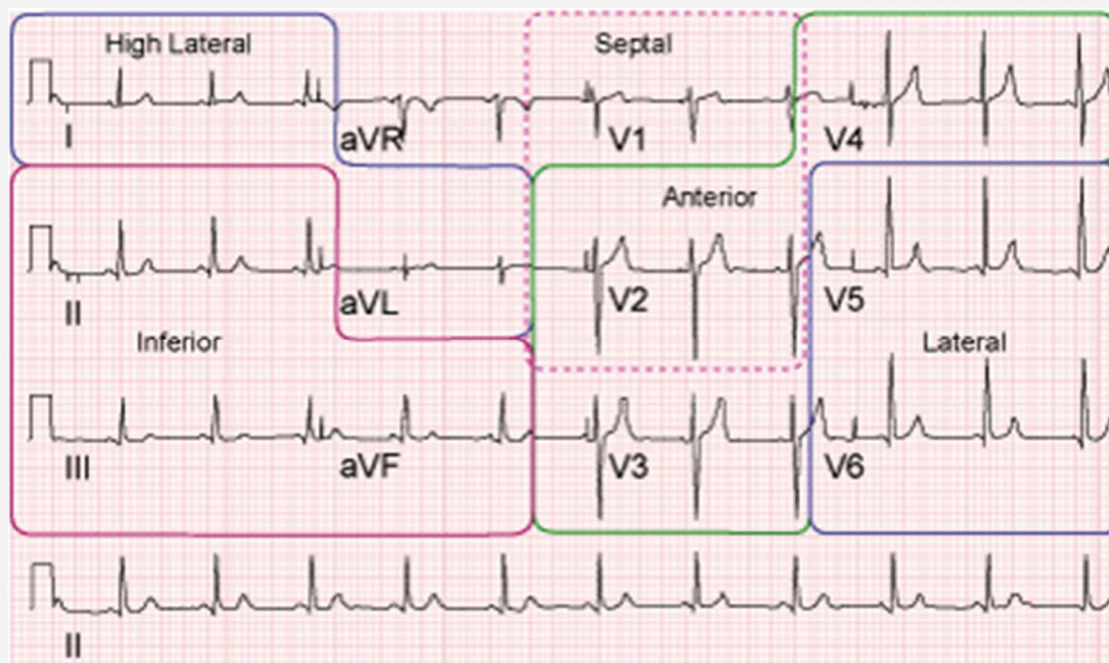
Other causes of Q waves: HOCM, SAH

4. 72 hours:

T wave inversion: in 75%; prominent R, R:S >1, narrow base; if deep, suggest subendocardial MI

5. Days-wks: ST elevation resolves

6. Days/wks/months: T waves normalize, Q waves disappear (in 15-30%)



ST depression/elevation: 70% sens, 95% spec

ST depression: LR 4 for MI; PPV 20% for MI; may represent posterior MI

Other causes of STD: accessory pathways, LV strain (downsloping, no J point dep, inverted/biphasic T wave in leads with prominent R wave); digoxin (reverse tick, esp lateral); RVH; post STEMI; incr ICP, Li toxicity

New conduction defect: LR 6 for MI; 7-15% with CP and LBBB have MI; 3% MI's have new LBBB; reperfusion therapy more beneficial in LBBB

Sgarbossa criteria

STE >5mm with negative QRS	(up down)	(50% sens, 90% spec)
STE >1mm with positive QRS	(up up)	(20% sens, 95% spec)
STD >1mm in V1-3	(down down)	(30% sens, 80% spec)
3/3 = 100% AMI	2/3 = 80% AMI	1/3 = 50% AMI
0 = 15% AMI		

NSTEMI: at least 1mm depression of J points; ST depression



Cardiac markers

BNP: predicts patients at risk of CV events, death, CCF

False –ive: Trop T/I: sens decr by haemolysis, ascorbic acid, SKA, heparin

False +ives:

All: sepsis, renal failure, cardiac OT/trauma, myocarditis

Trop T/I: TTP, large PE, severe acute cerebral disease, renal failure (20% overall, 50% in dialysis patients; Trop T more likely to be elevated than Trop I (up to 50% vs <10%); levels increase after dialysis (paradoxically)), muscle diseases (20% in DMD), CCF; inadequate blood in tubes, haemolysis

Total CK: exercise, compartment syndrome, rhabdo, trauma, burns, myopathy, hypothermia, hypothyroidism, cardioversion, IM injection

CKMB: trained athletes, CRF (in 4%), polymyositis (in 50%), diaphragm injury, IM injection, cardioversion; and many many more

Pros: may determine admission destination (eg. Monitored); may determine future mng (early elevation - good prognosis with aggressive lx and trt); serial values more useful (80% sens for MI if serials 3hrs apart in ED; <50% incr 3-6hrs apart unlikely clinically significant, >100% highly likely significant)

Cons: rarely useful in discharge decisions; don't detect unstable angina; if abnormal early then ECG will be suggestive; don't help decisions Re: thrombolysis; sens <20% for ACS, 40% for MI (60% if high sens test) at time in ED; peak levels at 12-16hrs

Other Investigations

ETT: incr sens and spec with multivessel disease; 5% true positive; identifies those at high risk of complication (prognostically useful; risk stratification, not diagnosis); doesn't exclude CHD when used alone; unreliable in low risk; 20% false +ive, 3% false –ives; do if low/mod risk

Technique: reach >85% max predicted HR

+ive: ST dep >1mm with pain/ST dep >3mm/decr SBP >20/incr DBP >15/arrhythmia

Strong +ive: diffuse ST dep >3mm/new STE/ST change recovery or angina >6mins

incr SBP >10 with evidence of ischaemia/VT

SEs: adverse events 1:2500 (MI, arrhythmia, decr BP, CCF, unstable angina); death 1:10,000

CIs: recent MI, CCF, inability to exercise, LBBB, high deg HB, fever, HOCM, AS, MS, uncontrolled HTN, pul HTN, L mainstem stenosis, unstable angina, uncontrolled symptomatic arrhythmia, PE, myocarditis, pericarditis, aortic dissection

Stress echo: sensitive marker of ischaemia (more than ECG / Sx); higher sens and spec than ETT (sens 80%, spec 84%)

Management

Low risk ACS: aspirin

Mod risk ACS: aspirin + clopidogrel

High risk ACS/unstable angina/NSTEMI: aspirin + clopidogrel + LMWH + beta-blocker

For thrombolysis: aspirin + clopidogrel + UFH (pre, LMWH post) + beta-blocker (post)

For PTCA: aspirin + clopidogrel + GIIb/IIIa + UFH (pre; LMWH post) + beta-blocker (post)

Oxygen: If low SaO₂ or ongoing chest pain; ??may incr mortality and infarct size in STEMI's via incr CA tone

Nitrates

GIVE TO ALL EXCEPT LOW RISK ACS

MOA: decr preload and afterload

Pros: 35% decr mortality rate in MI; decr infarct size

Cons: tolerance (develops after 24hrs)

Trt: 3-30mcg/min IV infusion, usually starting at 10mcg/min (to max 200mcg/min)

titrate to 10% reduction in MAP if normal BP, 30% if HTN (not to chest pain resolution)

CI: pre-load dependent states: RV infarction; AS, MS; concurrent administration of other vasoactive mediators; hypotension, sildenafil



AntiPlatelet Agents

Aspirin

GIVE TO ALL

ISIS2: 1988, 17,000; compared aspirin and SK alone, in combination, and placebo - decr mortality with combination compared to alone; aspirin alone as good as SK alone, both better alone than placebo

Unstable angina: decr risk of AMI and death from cardiac causes by 50-70%

STEMI: 3% decr AR mortality (ISIS2), 25% decr RR mortality (same as reperfusion therapy); decr 35/7 mortality from 13% to 8% in combination with SK

Trt: give 300mg PO to all

Clopidogrel

(CLARITY-TIMI 28, COMMIT, CURE) - GIVE TO ALL EXCEPT LOW RISK ACS

MOA: ADP receptor antagonist - decr plt aggregation

CLARITY-TIMI 28 and COMMIT trials: improved hospital/30/7 outcome when clopidogrel added to therapy

CURE trial: recommended use in NSTEMI

Trt: give 300mg for thrombolysis; give 600mg PO for PTCA; give to NSTEMI; \diamond 75mg/day

Cons: more bleeding complications than aspirin

CI: emergency CABG within 5 days expected (don't withhold clopidogrel if uncertain)

Clopidogrel + aspirin (CURE)

STEMI and NSTEMI: decr reinfarction rate by 1.5%

CURE: 20% decr death/AMI/CVA in 3-12/12 if those getting clop compared to aspirin alone in NSTEMI

Cons: Incr major bleeding rate by 1%

G IIb/IIIa RA (eg. abciximab, eptifibatide)

GIVE ONLY IF FOR PTCA

Pros: Most benefit seen in those receiving PCI; decr mortality when given at time of PTCA, not prior; 'reasonable';

Minor benefit when given with thrombolysis: decr 1yr mortality and reinfarction by 1.3% cf thrombolysis alone

NSTEMI: recommended if early revascularisation planned, or in ongoing ischaemia despite antiplt therapy

STEMI: recommend if high risk features (eg. positive trop, likely to receive PCI)

Cons: incr rate of ICH by 1% in >75yrs, incr rate of major haemorrhage by 0.5%; NNT 70; not useful in unstable angina; no regimen has shown improved outcome and may worsen outcome; less effect on early mortality

Anticoagulants

Heparin (SYNERGY):

UFH PRE-PTCA/THROMBOLYSIS

LMWH POST-PTCA, 24hrs POST THROMBOLYSIS, WITH NSTEMI and HIGH RISK ACS

Pros: Decr reinfarction / mortality by 33% when combined with aspirin; Decr frequency of ischaemic episodes and progression to AMI in unstable angina; ??shouldn't be given after SK??

If for PCI: use UFH aiming for APTT 300-350

If for thrombolysis: use UFH and aim APTT 1.5-2x normal \diamond change to LMWH 24hrs post and continue for min 48hrs; if <75yrs and normal renal function

Doses: UFH: **60iu/kg** (max 4000iu) \diamond INF at **12iu/kg/hr** (max 1000iu/hr); aim APTT 1.5-4x normal

LMWH: <75yrs: **30mg** IV bolus enoxaparin \diamond **1mg/kg** SC BD

>75yrs: **0.75mg/kg** SC BD

LMWH: pros: lower re-infarction rate; equally efficacious as UFH; more reliable; no need for monitoring; 2% decr death / MI when compared to UFH in STEMI trtd with aspirin and thrombolysis; 1% decr death / MI when compared to UFH in NSTEMI

Cons: higher major bleeding rate

UFH: Cons: unpredictable anticoagulant response, may take longer to load; requires monitoring of APTT; heparin-induced thrombocytopenia after 48hrs therapy

SYNERGY trial showed not good to switch between enox / UFH, as incr risk of bleeding



Cardiac Drugs

Beta-blockers

(ISIS 1, 3) – GIVE IF NSTEMI, HIGH RISK ACS, POST-PTCA, POST-THROMBOLYSIS

Pros: Decr infarct size, reinfarction and mortality by 50% when used alone and started within 24hrs; Decr rate cardiac rupture (ISIS1); Decr mortality with delayed therapy after thrombolysis; Decr risk of ICH by 30% (improve short term mortality when given with thrombolysis); decr short term mortality with thrombolysis; Helps control pain: if GTN and morphine not helping, and patient tachycardic, small increments may be helpful; Recommended in NSTEMI unless CI; decr progression of unstable angina to MI

Cons: Worsens Sx with large infarct / LVF, but still improves mortality (ISIS3)

Trt: metoprolol 50mg PO BD – aim to start within 24hrs

Atenolol 25-50mg PO Reserve IV for patients with significant HTN

CI: CCF, >70yrs, SBP <120, HR >110 / <60, PR >0.24, HB, active COPD / asthma, ETT planned

Ca channel antagonists – GIVE IF BETA-BLOCKER's CI'ed

Diltiazem: decr reinfarction rates in NSTEMI in 1st 14/7; No effect on infarct size / mortality

Trt: consider if ongoing ischaemia / rapid AF and no CCF, LV dysfunction or HB, and beta-blockers CI'ed

CI: nifedipine - reflex tachycardia

ACEi's – GIVE DURING / SOON AFTER

Pros: Decr risk of death, MI and CVA, LV dysfunction and dilatation; slow development of CCF; 6.5% decr in short term mortality rate; Prevent adverse cardiac remodeling

STEMI: commence within 1st 24hrs

NSTEMI: commence if HTN despite GTN and beta-blockers with decr LV function or CCF

CI: hypotension, bilat RAS, renal failure

Acute reperfusion

Aim: to salvage penumbra

Criteria:

STE in 2 contiguous leads (1mm limb, 2mm chest) or new LBBB+ ischaemic CP >30mins

Pros: most benefit <6hrs; may benefit >12hrs if haemodynamically unstable / ongoing Sx

NNT LBBB 21, Ant 28, inf 120, diabetes 20; 2.5% absolute overall mortality reduction; 2% absolute mortality reduction in 65-75yrs; greater benefit in old; 5-10% absolute improvement in LVEF (mostly in ant-septal); <1hr - 47% relative mortality decr (1-3hrs 23%, 3-6hrs 17%); NNT 15 at 1hr, 35 at 6hrs, 55 at 12hrs

SE: reperfusion arrhythmias (eg. Sinus brady, VEBs, nonsustained VT)

PTCA: goal within 60-90 mins ED arrival

Indications: Presentation <1hr available <60mins

Presentation 1-12hrs available <90mins

Presentation >12hrs haemodynamically unstable

Rescue angioplasty - <50% improvement of STE within 90mins thrombolysis / CCF <75yrs / ventricular arrhythmia

Pros: PTCA + aspirin = 6-7% absolute reduction in mortality; 90% reperfusion rate

cf thrombolysis: 1-2% absolute mortality advantage; Decr reinfarction rates by 2-4%; 1% fewer ICH's (PAMI and GUSTO 2b trials); Decr short and long term death; greater benefit in high risk MI's

**Greatest benefits when:**

>70yrs
late presentation (>3hrs; as delay has less negative effect on results than in TL)
high risk AMI, large AMI <6hrs
cardiogenic shock (60% survival)
RV involvement
prev CABGs (NOT prev thrombolysis)
ongoing pain post-thrombolysis

With stent: 15% absolute reduction in risk of restenosis (better than thrombolysis), improve rate of event free survival
With NSTEMI: may be beneficial (if recurrent angina, incr trop, new ST depression, high risk ETT, decr LV Fx, CV instability, sustained VT, CCF, prev CABG, PCI in prev 6/12)

Cons: not readily available; Expensive; Delay to treatment; Requires IV contrast (CI in CRF); stent occlusion in 4% within 2-14/7; DES can occlude 9-12/12 post-procedure; detectable myocardial necrosis occurs in 30% peri-procedure (decr by GIIb/IIIa ant); only 30% fit criteria, of those, risk/benefit unfavourable in 20%

Thrombolysis (GUSTO trial): goal within 30mins ED arrival

Indications: outwith time for PTCA/PTCA not available/Pre-hospital if >30min travel to hospital (and delay to PCI >60mins) **and** <6-12hrs from symptom onset

Absolute CI: aortic dissection, new neuro Sx, significant HI / prev CVA in 3/12, prev ICH, known AVM / brain Ca, **pericarditis**, active bleeding, **BP >180/120**

Relative CI: anticoagulation, non-compressible puncture, HTN (must have SBP <180, DBP <110), CPR, major OT in 3/52, CNS OT in 2/12, GI/GU haem in 1/12, active PU, Ca, **pregnancy**

Pros: Bigger role in rural populations; pre-hospital thrombolysis decr time to reperfusion by 40mins and 2% decr absolute mortality

thrombolysis + aspirin = 5% absolute reduction in mortality; 60-80% reperfusion rate; 40% survival in cardiogenic shock; Works best in: larger MI, anterior MI

Cons: Not beneficial in NSTEMI's (GISSI trial); Works badly in: smaller MI, inf MI; incr mortality if not STEMI

Trt:

Reteplase (10iu IV over 2mins - 2nd dose 30 mins later)

Tenecteplase (weight based, 30-50mg single dose)

Alteplase: 15mg bolus - 50mg (0.75mg/kg <65kgs) over 30mins - 35mg (0.5mg/kg <65kg) over 60mins

if: <75yrs **or** >75yrs and **hypotension** / indigenous / **>4hrs** since Sx onset / CI to SK / **ant MI**

(2% decr absolute mortality compared with SK); or prev SK

SE: incr incidence of ICH compared with SK, esp if >75yrs – but still have decr mortality compared to SK; 10x more expensive than SK

SK if: >75yrs / R or T not available: 1.5million IU over 60mins with heparin

SE: 5% allergic reaction (1.5% in tPA); 0.2% anaphylaxis; 15% hypotension during infusion; more affected by delay than tPA

CI: prev SK, recent sore throat / skin infection, severe hypotension, indigenous populations

Give heparin with all thrombolysis

SEs: 10% risk haemorrhage other than ICH; 2% risk ICH if 3 RF's, 0.25% if none; 10-20% risk decr BP (put head down and give 250-1000ml IVF; bone pain with SK

If bleed: stop infusion - 10iu cryo, 1iu plt, protamine (if heparin on board; 1mg for every 100iu heparin given over past 15mins), 2iu FFP, ?tranexamic acid

Aggressive statins: Decr ischaemic complications at 16/52 by 1.5%

MgSO4: Decr mortality by 25% with 2g bolus before thrombolysis and 16g/day as infusion (LIMIT2)

K: keep >3.5, as otherwise incr risk of VF

BSL control (DIGAMI): keeping 7-11 for 1st 24hrs - 8% decr mortality at 1yr, but no early benefit



Complications

Early:

Arrhythmias (high mortality if new LBBB; CHB suggests extensive damage, has mortality 15%)

RV infarction; CCF (mortality 80%); MR

Ventricular septal rupture (L-R shunt; 0.2% incidence; more common in anterior / inf / RV MI, HTN, female, Old, single vessel disease, large infarct, poor collateral circulation; most within 24hrs, or after 3-5/7; SOB, harsh pansystolic murmur, thrill in 50%, TR/MR in 20%, cardiogenic shock; mng with nitroprusside to decr afterload and inotropes - mechanical closure); >90% mortality rate; present with symptoms of tamponade

Myocardial rupture (1-5% incidence; usually 1-5/7 in 50%, within 2/52 in 90%; CP, rapid deterioration, pericardial tamponade; incr risk if no collateral flow, large infarct, on thrombolytics)

Pericarditis (in 10-20%; usually transmural MI; occurs in 2-4/7)

Papillary muscle rupture - MVR (incidence 1%; occurs in smaller MI's; on D1; sudden onset CCF and MR; trt with afterload reduction and OT); occur in inferior MI's

Late: LV aneurysm (occurs over 6/12; incidence 5-10%; M:F 4:1; 85% ant, 10% post, 5% lat; LVF; needs OT)

Mural thrombus; DVT; PE; cardiac neurosis

Dressler's syndrome (2-10/52; CP, fever, pericarditis)

STEMI Mimics

Aortic dissection (RCA/LCA affected)

Prinzmetal's

Pericarditis (widespread ST elevn, concave up, PR depression, reciprocal changes aVR)

Myocarditis

Benign Early Repol (fish-hook, concave up, V1-V3, young men)

LV Aneurysm (anterior Q, ST elevn)

LVH

LBBB +/- AMI (Scarbossa's criteria)

RBBB

Brugada Syndrome (RBBB & ant ST elevn)

Raised ICP

Cocaine - vasospasm

Balanced circulation in 60-65%; R dominant in 20-25%; L dominant in 10-15% (poor survival if septal MI); LAD and RCA more commonly involved than LCX; 40% have 3VD; 10-20% with significant disease have L main involvement; 50% develop new lesions within 2yrs



Region	Vessel	Leads	Reciprocal	Facts
Antero-septo - lateral	Prox LAD L main CA	aVL, aVR > V1-6, I	II, III, aVF - prominent	Highest risk (mortality 70% , responds poorly to medical trt); the widow maker STE aVR 80% sens and spec for Prox LAD
Septal	LAD – 40-50% (Ant, septal, apex; Distal 2/3 RBB; Ant LBB) Septal branch of LAD (Ant 2/3 septum; Anterior LBB)	V1 -2	Reciprocal changes in 30%; less prominent than in prox lesions	Most common; worst prognosis; 10% mortality; most benefit from reperfusion therapy; tPA better than SK Beware: CHB (3 rd deg, poor prognosis), Mobitz II, RBBB STE V1 > aVR (40% sens, 95% spec for septal)
Lateral	LCX (Lat and post LV ; SAN (40%); AVN (10%)) Diagonal branch of LAD (Ant LV + RV)	V4-6 I, aVL	Reciprocal in II, III, aVF	Assoc with posterior and RV Beware: V rupture
High lateral	LAD	I, aVL		
Inferior	RCA 30-40%: inf LV, SAN (60%); AVN (90%); BOH; Prox 1/3 RBB; Post LBB; Post 1/3 septum) LCX 15-20%	II, III, aVF	Reciprocal in I, aVL (early), V1-3 (in 80%)	Assoc with posterior and RV (involved in 1/3) Beware: CHB, <u>GTN use, papillary muscle rupture</u> 5% mortality; causes LAD RCA: STE III > II LCX: STE II>III (>90% sens and spec) STD aVR (35% sens, 85% spec)
Posterior	RCA: Low lateral wall; Post LV and LA) LCX	V7-9 II, III, aVF Inf + Lat = ?post	V1-3 (+ tall T and R waves, R:@ >1)	Usually assoc with inf / lateral MI's
Inferior + R ventricle 25-30%	Prox RCA (in 90%) Occurs in 1/3 of inferior MI's If bigger STE in V3 than V2, ?RV infarct	aVL	V3R-6R Look at V1!!! III > II, aVF Inf + septal = ?RV	Assoc w inf/lat/post MI Don't use GTN Give 1-2L IVF ◇ if no response start inotropes (dobutamine); nitroprusside to decr afterload may help Incr JVP Beware HB; > 30% mortality)