

Management of ACS

Based on ACC/AHA & ESC Guidelines

Dr Badri Paudel

Clinical Case

- Mr M
- 75M
- Poorly controlled diabetic
- Smoker
- Presented on Sat 7pm
- Intense burning in the retrosternal area

- ## Clinical Case
- Mr M
 - 75M
 - Poorly controlled diabetic
 - Smoker
 - Presented on Sat 7pm
 - Intense burning in the retrosternal area
 - 96bpm
 - 110/70
 - Clear chest
 - No S₃ or murmur

Admission	Chest Pain		
Working diagnosis	Suspicion of Acute Coronary Syndrome		
ECG	Persistent ST ↑	ST ↓ or T ↓	Normal ECG
Biochemistry	Trop +ve		Trop -ve
Risk Stratification	High Risk		Low Risk
Diagnosis	STEMI	NSTEMI	USA
Treatment	Reperfusion	Invasive	Non-invasive

ESC guidelines 2007



U/NSTEMI: Definition

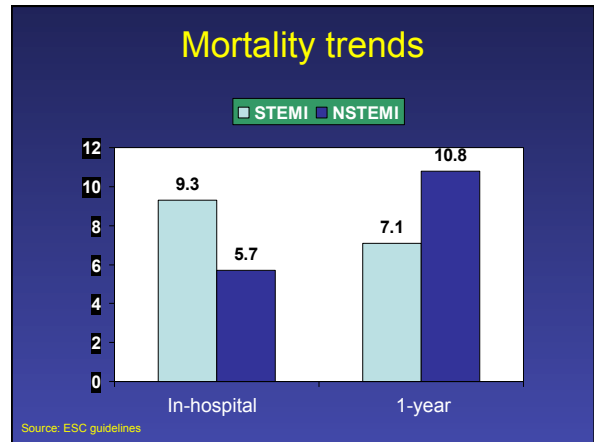
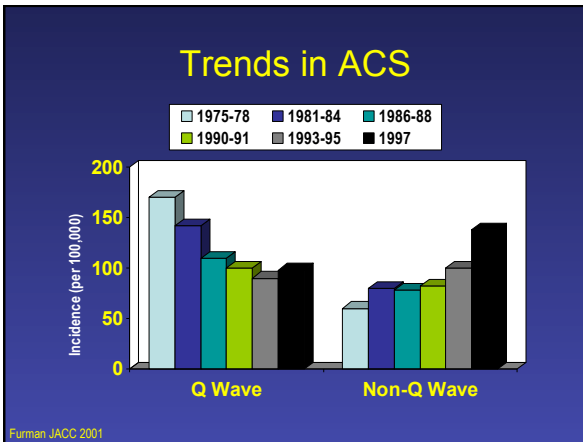
ST ↓ or prominent T ↓ on ECG

and/or

Positive biomarkers in absence of ST elevation

in

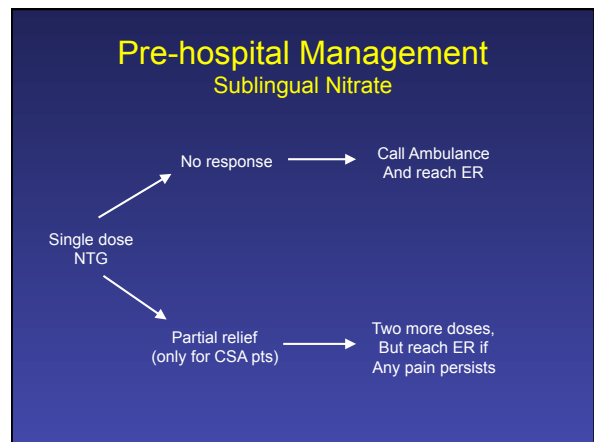
an appropriate clinical setting

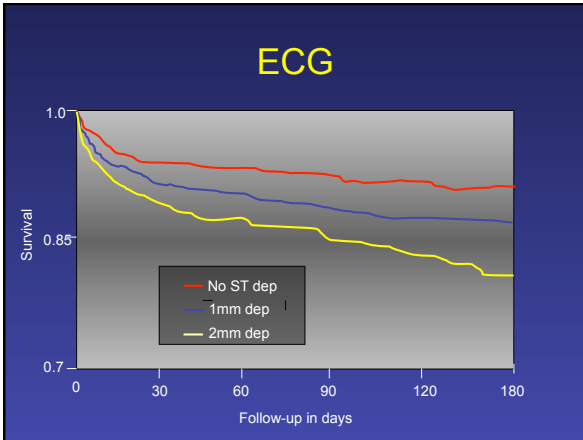


- ### Implications of Statistics
- NSTEMI-ACS commoner than STEMI
 - ACS patients tend to be
 - Older
 - More diabetes
 - More renal failure
 - Other co-morbidities
 - Overall, similar 1-yr mortality

- ### Principal Presentations
1. Rest angina
 2. New-onset angina
 3. Increasing angina

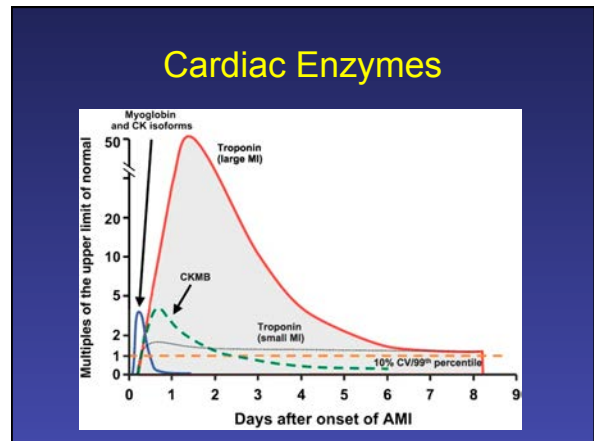
- ### Pre-hospital Management Aspirin
- Chest pain pts to have 162.5 -325mg aspirin as early as possible
 - Chewable/soluble aspirin preferred over enteric coated



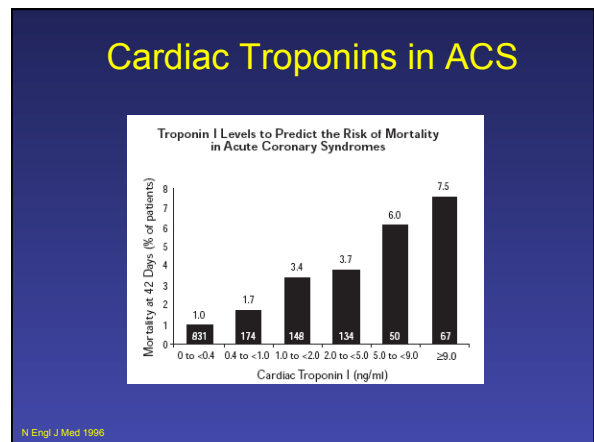


- ### Time Goals
- Initial ECG performed & interpreted
 - Within 10 min of arrival
 - Initial ECG non-diagnostic
 - Serial ECGs 15-60min apart

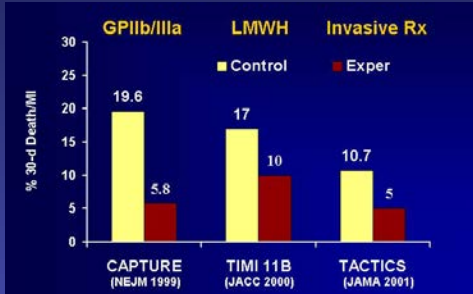
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- ### Clinical case
- M, 75M
 - DM, Smoker
 - Rest pain
 - Clinically stable
 - ECG change
- Troponin T
0.7ng/mL



Troponins for Rx decisions



Role of Echo in Risk Assessment

- RWMA
- LV dysfunction
- Associated valvular abnormalities
- Differential diagnosis

Clinical case

- M, 75M
- DM, Smoker
- Rest pain
- Clinically stable
- ECG changes
- Positive Trop-T

Echo: Hypokinetic Ant wall. EF 50%

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Risk Stratification - Purpose

1. Likelihood of obstructive CAD
2. Risk of adverse outcomes

TIMI Risk Score for USA/NSTEMI

Elements of TIMI Score for risk stratification in USA

- Age ≥ 65 years
- ≥ 3 traditional CAD risks
- Prior coronary lesion ≥ 50%
- ST-segment deviation on admission ECG
- ≥ anginal episodes in last 24 hrs
- Prior aspirin use
- Elevated cardiac enzymes

Presence of each element is assigned 1 point

14-day event risk with TIMI Score

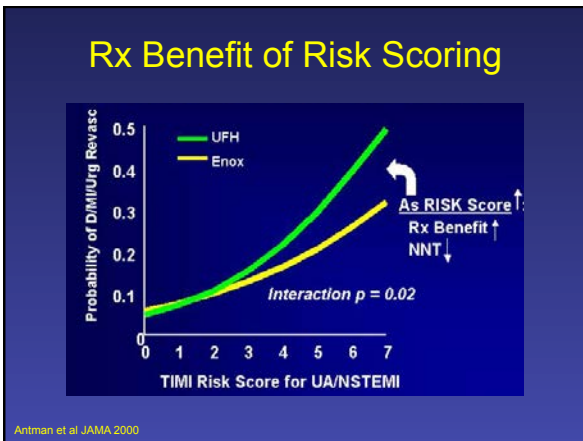
TIMI Score	Event rates
0 or 1	4.7%
2	8.3%
3	13.2%
4	19.9%
5	26.2%
6/7	40.9%

With increasing risk score there is progressively greater benefit from therapies like LMWH, platelet gpIIb/IIIa inhibitors & invasive strategy

Clinical case

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- Rest pain
- Clinically stable
- Admission ECG
- Trop-T Positive
- RWMA, EF 50%

TIMI risk 4 points



Macromedia Flash Player 7

GRACE ACS Risk Model

At Admission (in-hospital/to 6 months) | At Discharge (to 6 months)

Age: 50-59

HR: 70-89

SBP: 120-139

Creat.: 1.6-1.99

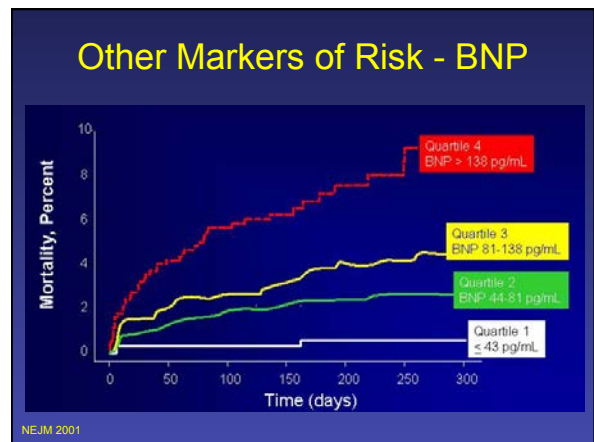
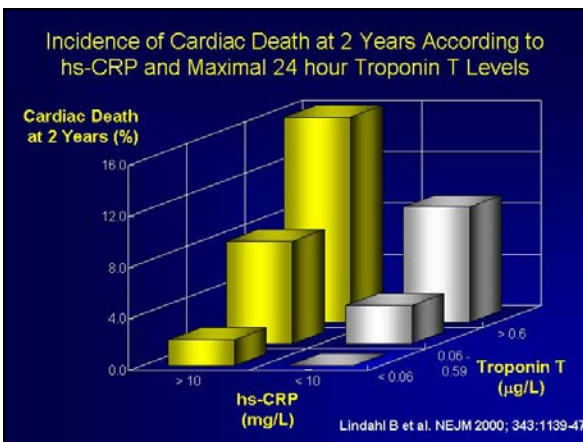
CHF: III (pulmonary edema)

Probability of Death: In-hospital 27%, To 6 months 30%

Probability of Death or MI: In-hospital 50%, To 6 months 70%

SI Units | Reset

Calculator | Instructions | GRACE Info | References | Disclaimer



Quick Re-Cap

- NSTEMI-ACS as important as STEMI
- Risk stratification aims at CAD diagnosis & estimating risks to help Rx decisions
- Newer Markers are emerging, but risk scores are currently the best way to predict outcomes

Hospital Management

History, examination, ECG & initial biomarkers should help classify chest pain patients into:

- Possible ACS
- Definite ACS
- Chronic stable angina
- Non cardiac diagnosis

Hospital Management Possible ACS

- Normal ECG
 - Observe, serial ECGs, Serial enzymes
 - If negative, discharge after stress test*
- Abnormal ECG
(or follow-up ECGs/enzymes turn positive)
 - Treat as definite ACS

* Or schedule stress test on OP basis

Hospital Management Definite ACS

- Admit to CCU or step-down unit
- Continuous ECG ± SpO₂ monitoring
- Supplemental oxygen to pts with low SpO₂, respiratory distress, basal creps

Anti-ischemic Therapy

- Rest / Oxygen
- Nitrates (sublingual/oral/topical, IV for ongoing pain)
- Morphine IV (pain, CHF)
- β-blocker (oral, IV for ongoing pain)
- Non-dihydropyridine Ca²⁺ blocker (verapamil /diltiazem)
- ACE Inhibitors

Anti-Ischemic Therapy Contraindications for nitrates

Nitrates contraindicated in:

- SBP < 90mmHg or ≥ 30mmHg below baseline
- Severe bradycardia (< 50 bpm)
- Tachycardia (>100 bpm)
- RVMI
- Pts with ED who took sildenafil in last 24h or tadalafil in last 48h

Anti-Ischemic Therapy Beta-blockers

- Start β -blocker within first 24h for patients who do not have:
 - signs of HF
 - low-output state
 - high risk for cardiogenic shock
 - AV block, asthma

Anti-Ischemic Therapy Calcium channel blockers

- Verapamil or diltiazem: initial therapy if LV function is normal & if β # cannot be given
- Immediate-release dihydropyridine Ca- antagonists not to be used unless combined with a β -blocker

Anti-Ischemic Therapy ACEI/ARB

- ACEI for pulmonary congestion or LVEF \leq 40%
- Contraindicated if
 - hypotension (SBP $<$ 100 mmHg or $<$ 30 mmHg below baseline)
 - or other known contraindications
- ARB may be used in pts intolerant of ACEI

Anti-coagulants

UFH	LD: 60 U/ kg (max 4000 U) Infusion: 12 U/kg/ h (max 1000 U/ h) Maintain aPTT 1.5- 2.0 times control
Enoxaparin	LD: 30 mg IV bolus MD: 1 mg/ kg SC q12h
Fondaparinux	2.5 mg SC once daily

Platelet GP IIb/IIIa Receptor Antagonists

1. In all patients managed with invasive Rx
2. Patients who continue to have ischemia despite ASA+CLOP+heparin
3. Patients in the high risk group

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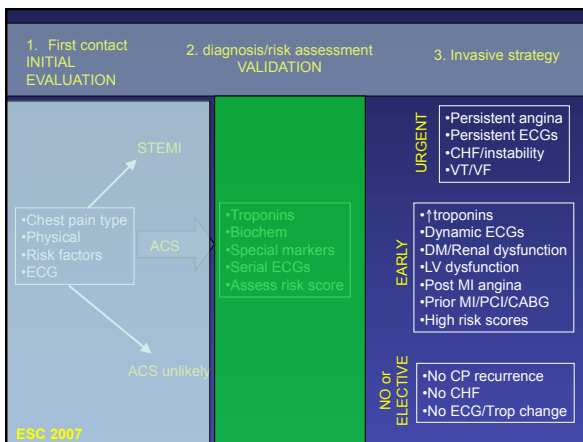
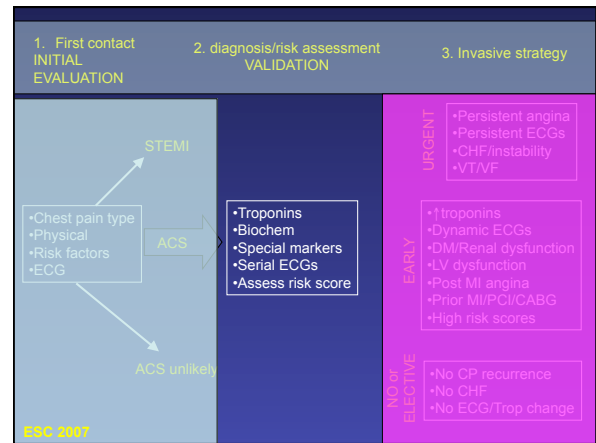
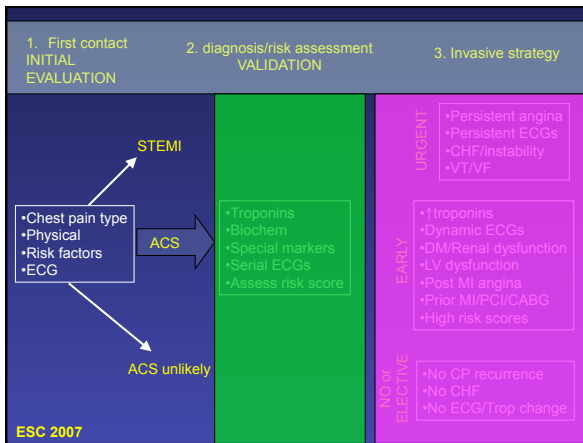
Pain persists
Same ECG

**Eptifibatide bolus followed
By infusion started**

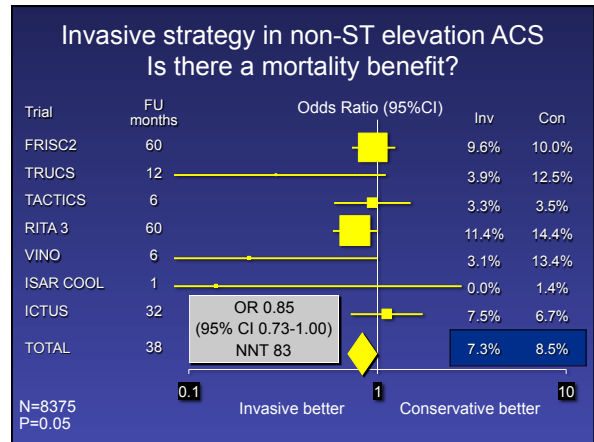
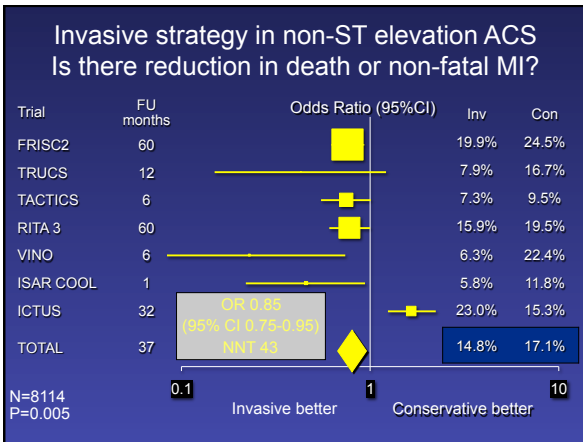
Choice of GpIIb/IIIa blocker

- IV eptifibatid or tirofiban is the preferred choice
- Abciximab is indicated only if PCI is likely without appreciable delay

Select Management Strategy: Initial Invasive Versus Initial Conservative Strategy



Evidence for Early Invasive Rx



Routine vs Selective Invasive Strategies in ACS

To Cath or Not to Cath That Is No Longer the Question

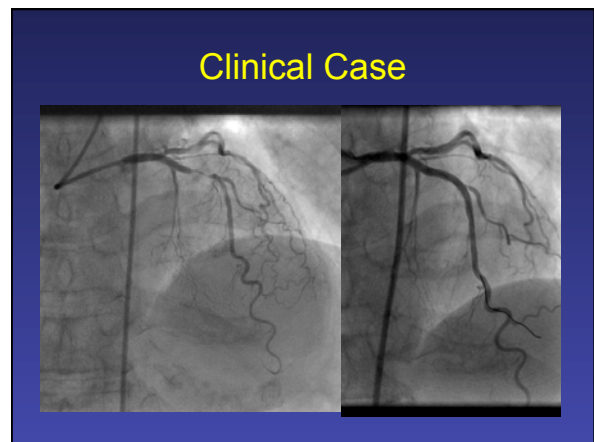
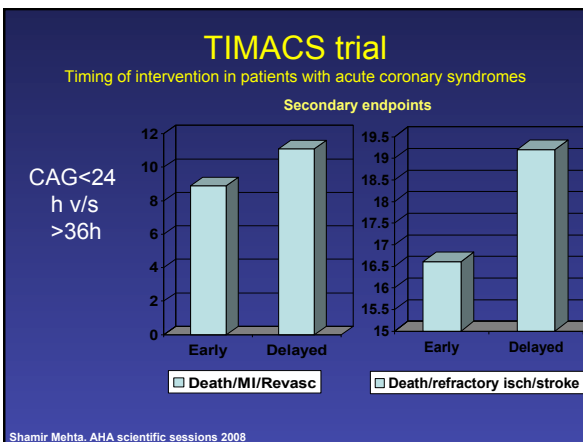
How Soon should we cath?

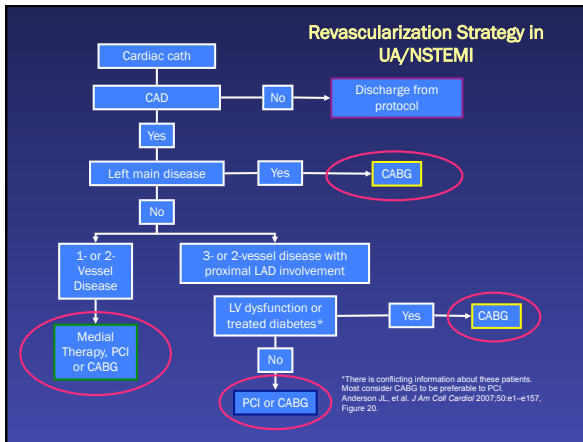
ISAR-COOL: Major results at 30 days

End point	Cooling off (%)	Early intervention (%)
Death/MI	11.6	5.9
Death	1.5	0
Nonfatal MI	10.1	5.9
Q-wave MI	3.4	2.0

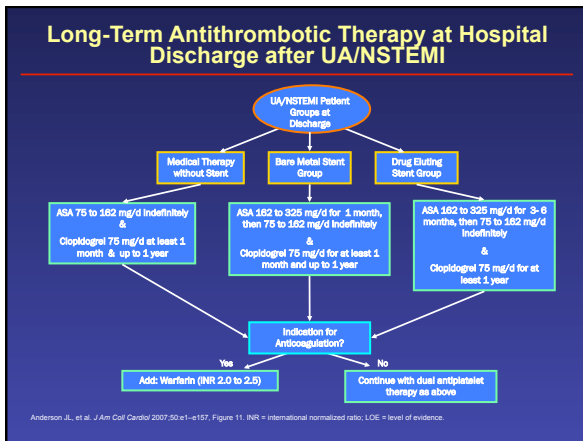
Significant reduction in primary endpoint (p=0.04)

Neumann F.J. AHA Scientific Sessions 2002





- ### Post-Discharge care
- Drugs required in the hospital to control ischemia should be continued after hospital discharge
 - Education about symptoms of AMI & how to seek help
 - ASA 75 to 325 mg/d
 - Clopidogrel 75 mg/d
 - β -Blockers if no contraindications
 - Lipid-lowering agents & diet
 - ACEI if CHF, LVEF<0.40, HT or diabetes



- ### Special Subsets Diabetes Mellitus
- Aggressive Rx approach just like non-diabetics
 - Focus on good glycemic control
 - Prefer CABG if multivessel disease suitable for both Rx modes

- ### Special Subsets Older Patients
- Management intent similar to the young
 - Include functional status & co-morbidities in decision making
 - Dosage adjustments

- ### Special Subsets Women
- No difference in medical Rx
 - Recommendations for invasive strategy: similar to those of men
 - In women with low-risk features: conservative strategy similar to men

Thank You