



SOCIETY OF CARDIOVASCULAR
PATIENT CARE

AN INSTITUTE OF THE AMERICAN COLLEGE OF CARDIOLOGY

Do I Stay or Do I Go?

Risk Stratify Low Risk Acute Coronary Syndrome Patient.

By Kay Styer Melching MSA, RN, AACCC, CPHQ, COS



- FO
R1 The participant will create an algorithm risk stratifying which patient presenting to the emergency department with chest pain is safe to go home versus observation care.

- FO
R1 The participant will describe current research literature regarding risk stratification of the patient presenting with chest pain.

- FO
R1 The participant will discuss the liability potential of the low risk ACS patient to the health care system.

SCPC is now part of the American College of Cardiology



Building on our collective strengths



The merger will leverage the strengths of both organizations to build upon shared goals of transforming cardiovascular care and improving heart health.

Cost Prevention versus Cost Avoidance



The key to wellness and its efficacy is in cost avoidance - it is not in cost prevention.

The objective is to decelerate the trend in rising health care costs.

Health care is no longer about volumes, it is about quality outcomes and cost avoidance.

Cost Prevention define



- FO
R1 An expense incurred as part of the quality control efforts of healthcare performed in order to avoid having poor quality outcomes
- FO
R1 *** Cost Avoidance define:***
- FO
R1 Refers to reductions that cause future spending to fall, but usually not below the level of current spending

Acute Coronary Syndrome (ACS)



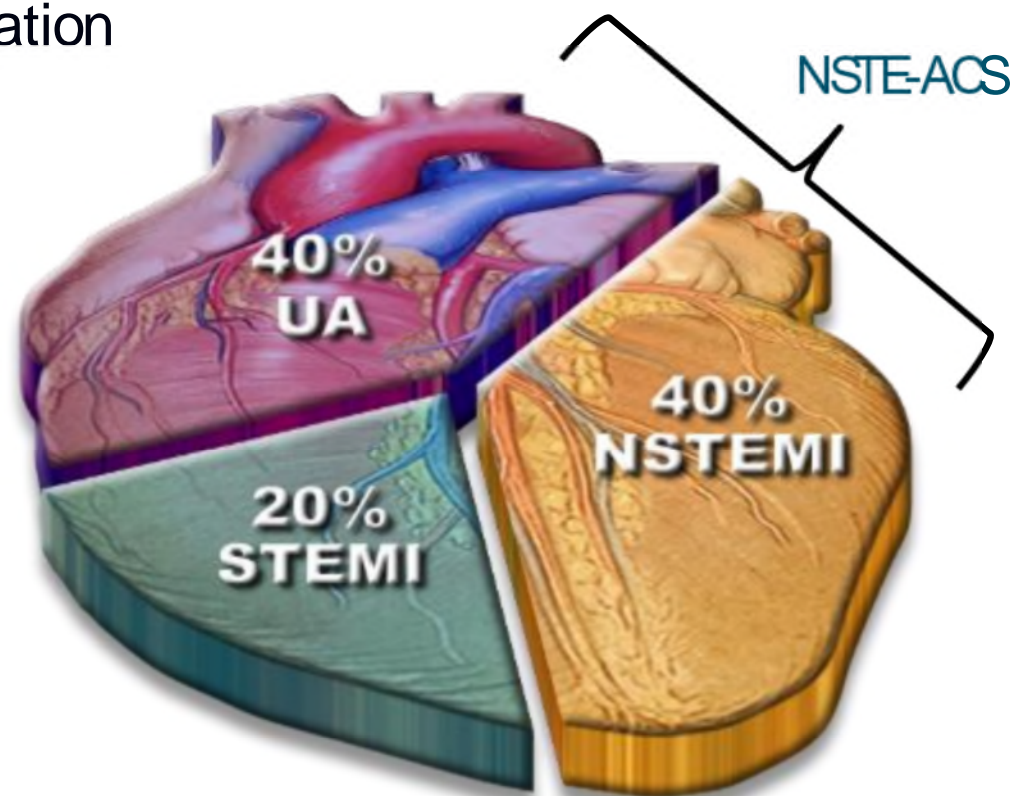
- Estimated 5-8 million patients present to the ED annually for chest pain
- Estimated cost for this patient population is 10-12 billion annually

20-25% diagnosed with Acute Coronary Syndrome

2,000,000

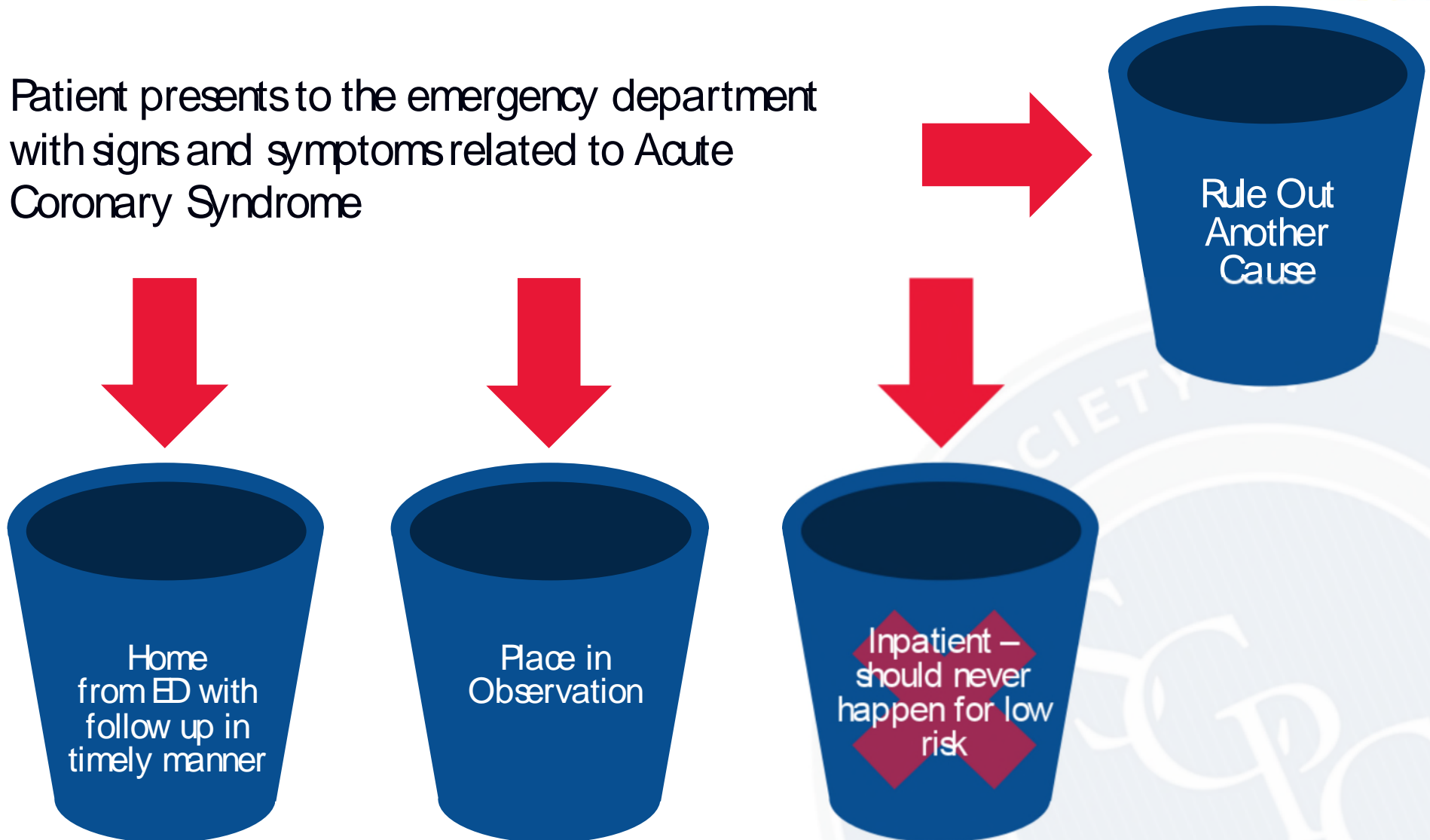
Low Risk/ Observation Population:
The other 6,000,000+ people

Source: American Heart Association 
Learn and Live



Low Risk Patients Fall Into Three Buckets

Patient presents to the emergency department with signs and symptoms related to Acute Coronary Syndrome



Tools in the Tool Kit





Simple Definition of GESTALT

Psychology: something that is made of many parts and yet is somehow more than or different from the combination of its parts; broadly: the general quality or character of something



RESEARCH:

- FO
R1 N=575 patients admitted to an inpatient unit or the ED observation protocol.
- FO
R1 When the ED physician was presented with a hypothetical zero medicolegal risk, they answered that they would not have admitted the patients in 30% of the cases.
- FO
R1 With a hypothetical 1-2% acceptable miss rate, physicians indicated they would not have admitted the patients in 29% of the cases.
- FO
R1 20% of all Emergency Medicine malpractice dollars are paid out for low risk ACS

Haker, Haslings, et al., ACADEMIC EMERGENCY MEDICINE • July 2015, Vol. 22, No. 7 • www.aemj.org

Letters to the Editor

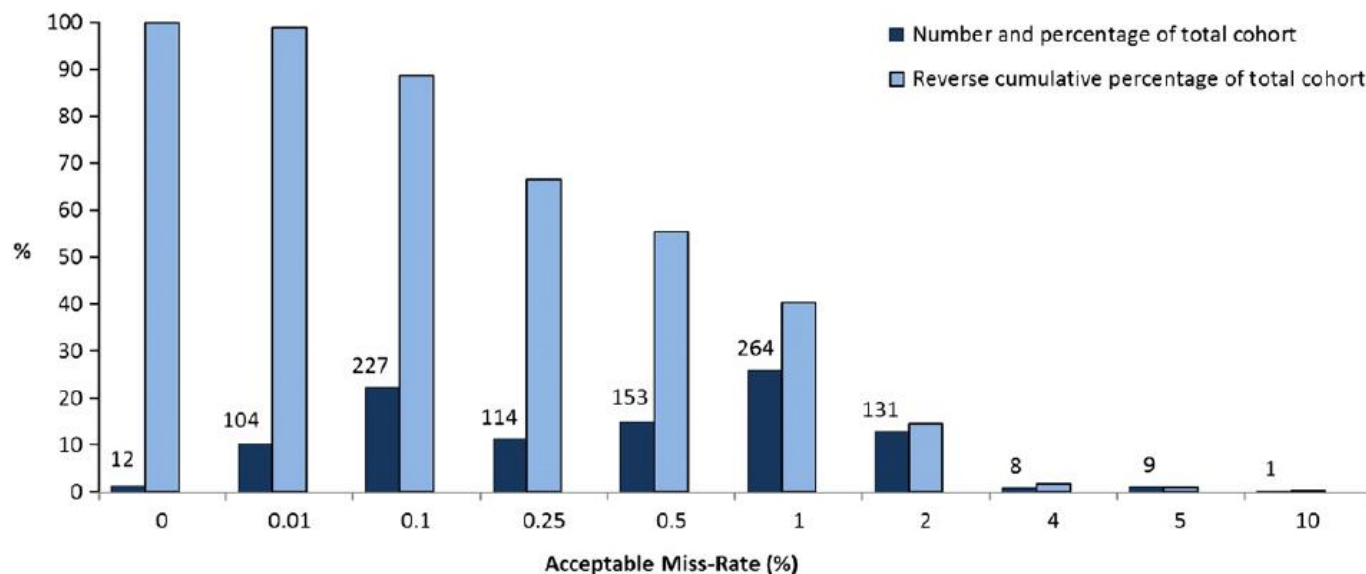


Fig. 1. Acceptable miss-rate of major adverse cardiac events.

What is an acceptable risk of major adverse cardiac event in chest pain patients soon after discharge from the Emergency Department?

A clinical survey- N=1029

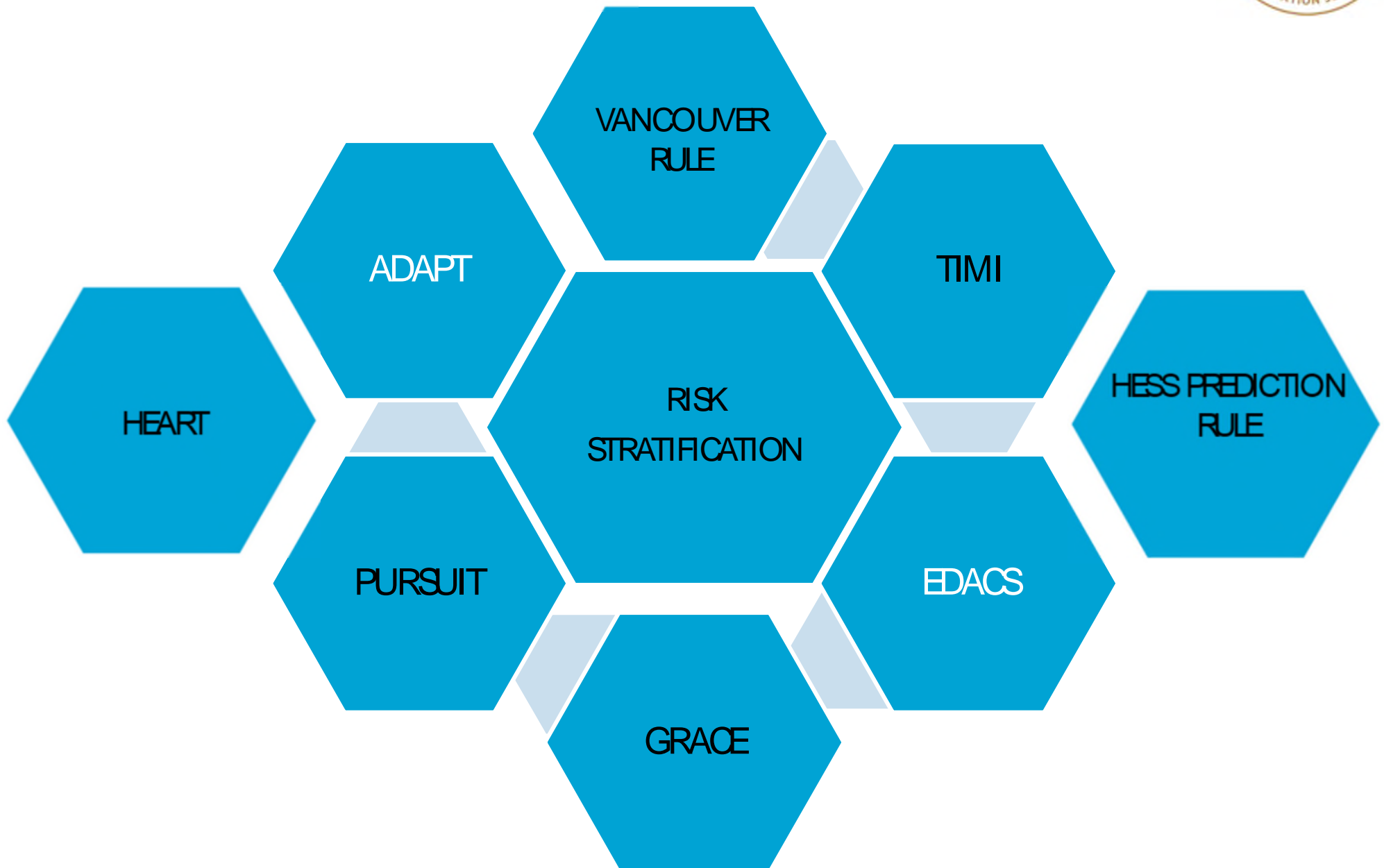
What level of risk of possibly missed major adverse cardiac event (MACE) within 30 days do you consider acceptable to allow discharge and cessation of investigations in a patient presenting to the Emergency Department with symptoms suggestive of an Acute Coronary Syndrome?

Martin Than a,*, Mel Herbert bet al. <http://dx.doi.org/10.1016/j.ijcard.2012.09.171>

Risk Stratification



Risk Stratification Tools



Emergency Department Assessment of Chest Pain Score (EDACS)

Identifies chest pain patients with low risk of major adverse cardiac event.

- This score only applies to patients:**
- ≥ 18 years old with normal vital signs
 - Chest pain consistent with ACS
 - No ongoing chest pain or crescendo angina

Age years

Sex Male Female

Known coronary artery disease or ≥ 3 risk factors

- Than et. al. define coronary artery disease (CAD) as "previous acute myocardial infarction, coronary artery bypass graft or percutaneous intervention."
- Risk factors: family history of premature CAD, dyslipidaemia, diabetes, hypertension, current smoker.
- The risk factors only apply to patients 18-50.

+4 NO

Symptoms and Signs

Diaphoresis +3 NO

Pain radiates to arm, shoulder, neck or jaw +5 NO

Pain occurred or worsened with inspiration -4 NO

Pain is reproduced by palpation -5 NO

ADAPT Protocol for Cardiac Event Risk

Assesses chest pain patients at 2-hours for risk of cardiac event.

Troponin Negative at 0h and 2 h

YES NO

EKG has no new Ischemic Changes

YES NO

TIMI Score

Note: Since the TIMI Score includes cardiac enzyme and ST deviation, these are not listed below since they are already included above.

Age \geq 65 years

YES NO

\geq 3 CAD Risk Factors

Family history of coronary artery disease, hypertension, hypercholesterolemia, diabetes, or current smoker

YES NO

Known CAD (Stenosis \geq 50%)

YES NO


Aspirin Use in Past 7 days

YES NO



Severe angina (\geq 2 episodes in 24 hrs or persisting discomfort)

YES NO

STUDY OBJECTIVE:

 A 2-hour accelerated diagnostic pathway based on the Thrombolysis in Myocardial Infarction score, ECG, and troponin measures (ADAPT-ADP) increased early discharge of patients with suspected acute myocardial infarction presenting to the emergency department compared with standard care (from 11% to 19.3%). Observational studies suggest that an accelerated diagnostic pathway using the Emergency Department Assessment of Chest Pain Score (EDACS-ADP) may further increase this proportion.

CONCLUSION:

-  There was no difference in the proportion of patients discharged early despite more patients being classified as low risk by the EDACS-ADP than the ADAPT-ADP.
-  Both accelerated diagnostic pathways are effective strategies for chest pain assessment and resulted in an increased rate of early discharges compared with previously reported rates

Effectiveness of EDACS Versus ADAPT Accelerated Diagnostic Pathways for Chest Pain: A Pragmatic Randomized Controlled Trial Embedded Within Practice. *J Am Emerg Med*. 2016.;68:93-102.

OBJECTIVE To review systematically the accuracy of the initial history, physical examination, electrocardiogram, and risk scores incorporating these elements with the first cardiac-specific troponin

CONCLUSIONS AND RELEVANCE Among patients with suspected ACS presenting to emergency departments, the initial history, physical examination, and electrocardiogram alone did not confirm or exclude the diagnosis of ACS

Instead, the HEART or TIMI risk scores, which incorporate the first cardiac troponin, provided more diagnostic information.

Does This Patient With Chest Pain Have Acute Coronary Syndrome?

The Rational Clinical Examination Systematic Review. Alexander Fanaroff, Jennifer A. Rymer, Sarah A. Goldstein, et al; JAMA. 2015;314(18):1955-1965.

- FO**
RT
- The ability to risk stratify patients presenting to the emergency department (ED) with potential acute coronary syndrome (ACS) is critical.
- The thrombolysis in myocardial infarction (TIMI) risk score can risk stratify ED patients with potential ACS but cannot identify patients safe for ED discharge.
 - The symptom-based HEART score identifies very low-risk patients. Our hypothesis was that patients with a TIMI score of 0 or 1 may be stratified further with the HEART score to identify a group of patients at less than 1% risk of 30-day cardiovascular events

CONCLUSION: At all levels of TIMI score, the HEART score was able to further sub-stratify patients with respect to 30-day risk. A HEART score of 0 in a patient with a TIMI of 0 identified a group of patients at less than 1% risk for 30-day adverse events.

Shannon Marcoon, BA, Anna Marie Chang, MD, Betsy Lee, MD, Rama Salhi, MHS, Judd E Hollander, MD, HEART Score to Further Risk Stratify Patients With Low TIMI Scores. Critical Pathways in Cardiology • Volume 12, Number 1, March 2013



Although no definitive study has demonstrated the superiority of risk assessment scores or clinical prediction rules over clinician judgment, determination of the level of risk on initial evaluation is imperative to guide patient management including the need for additional diagnostic testing and treatment

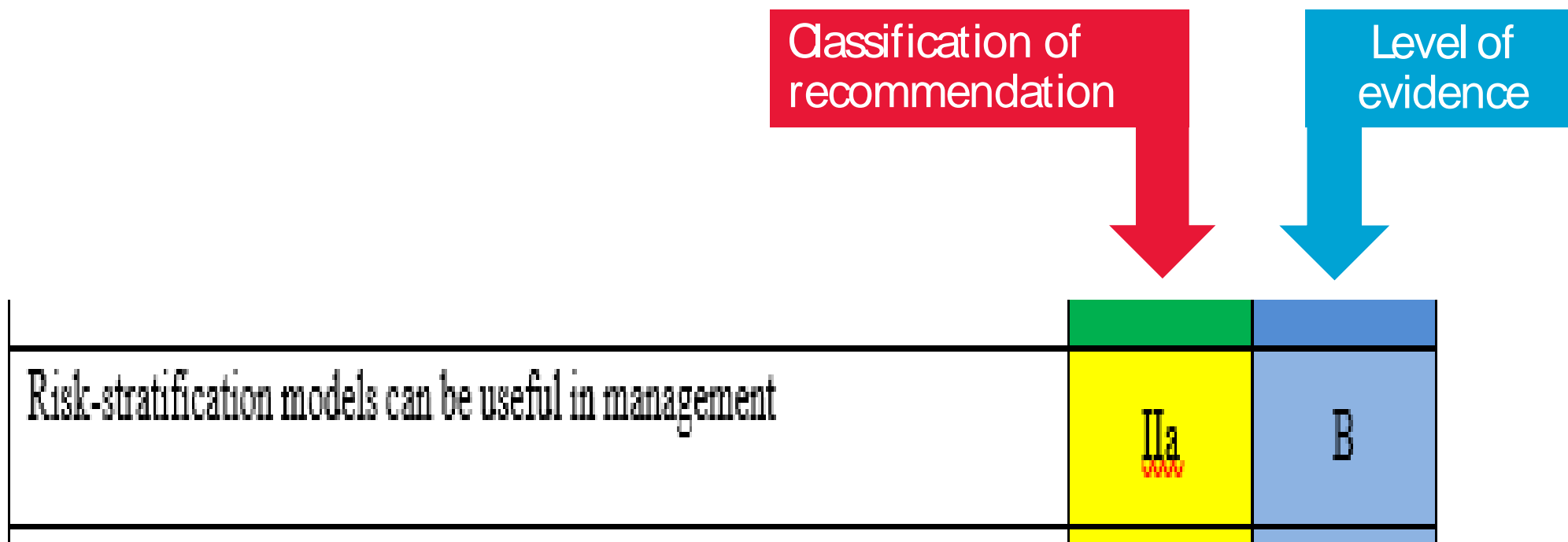


Table 1. Modified North American Chest Pain Rule

A patient with chest pain and possible acute coronary syndrome can be safely discharged without additional diagnostic testing if **NONE** of the following five criteria is present:

1. New ischemia on initial ECG

2. History of coronary artery disease

3. Pain is typical for angina, which has **ALL** of the following features: a) substernal chest discomfort with a characteristic quality and duration that is b) provoked by exertion or emotional stress and c) relieved by rest or nitroglycerine

4. Initial or 6-hour troponin cardiac troponin is greater than 99th percentile

5. Age greater than 50 years

Table 2. Test Characteristics of the Modified NACPR in Patients with Low-Risk Chest Pain

NACPR Criteria Present	Composite Outcome of Death, Acute Myocardial Infarction and Coronary Revascularization	
	Yes (n)	No (n)
Yes	9	220
No	0	69
Sensitivity (%):	100	95%CI: 66.21 to 100
Specificity (%):	23.88	95%CI: 19.08 to 29.22
Positive likelihood ratio:	1.31	95%CI: 1.23 to 1.40
Negative likelihood ratio:	0	n/a
PPV (%):	3.93	95%CI: 1.82 to 7.33
NPV (%):	100	95%CI: 94.74 to 100
Prevalence (%):	3.02	95%CI: 1.39 to 5.66

Cerasale M, Paje D, Calle C, Patsias I. Application of the North American Chest Pain Rule in the Observation Unit Setting [abstract]. Journal of Hospital Medicine. 2014; 9

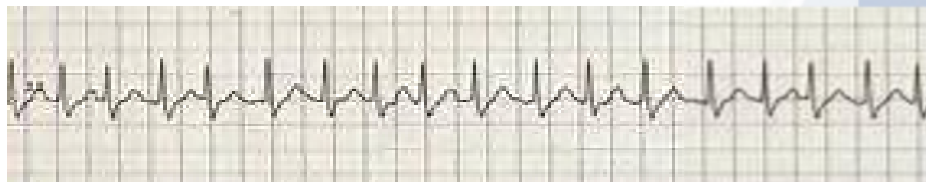
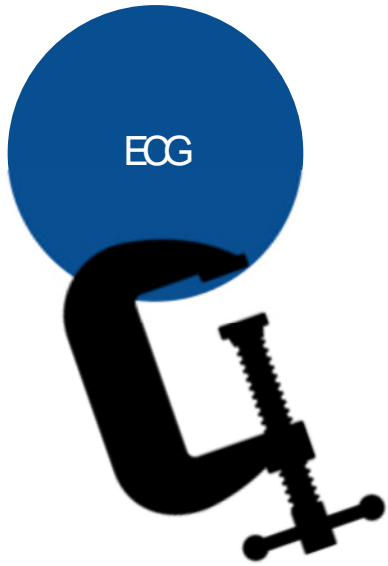
- FO
RI A secondary analysis was conducted of 1005 participants in the MIDAS Study. The ability to identify participants for early discharge and the sensitivity for ACS at 30 days were compared among an **unstructured assessment, NACPR, and HEART score**, each combined with troponin measures at 0 and 3h. ACS, defined as cardiac death, acute myocardial infarction, or unstable angina, occurred in 22% of the cohort.
- FO
RI The **unstructured assessment identified 13.5%** (95% CI 11.5-16%) of participants for early discharge with 98% (95% CI 95-99%) sensitivity for ACS.
- FO
RI The **NACPR identified 4.4%** (95% CI 3-6%) for early discharge with 100% (95% CI 98-100%) sensitivity for ACS.
- FO
RI The **HEART score identified 20%** (95% CI 18-23%) for early discharge with 99% (95% CI 97-100%) sensitivity for ACS.
- FO
RI The HEART score had a net reclassification improvement of 10% (95% CI 8-12%) versus unstructured assessment and 19% (95% CI 17-21%) versus NACPR.

CONCLUSIONS The HEART score with 0 and 3 hour serial troponin measures identifies a substantial number of patients for early discharge while maintaining high sensitivity for ACS.

Table 1. Outcomes by ED Strategy

	HEART Pathway (n = 141)	Usual Care (n = 141)	P Value
Objective Cardiac Testing \leq 30 Days	56.7%	68.8%	.048
Early Discharge	39.7%	18.4%	< .001
Length of Stay, hours	9.9	21.9	.013

Mahler SA, Riley RF, Hiestand BC, et al. The HEART Pathway randomized trial: identifying emergency department patients with acute chest pain for early discharge. *Circ Cardiovasc Qual Outcomes*. 2015;



Class I

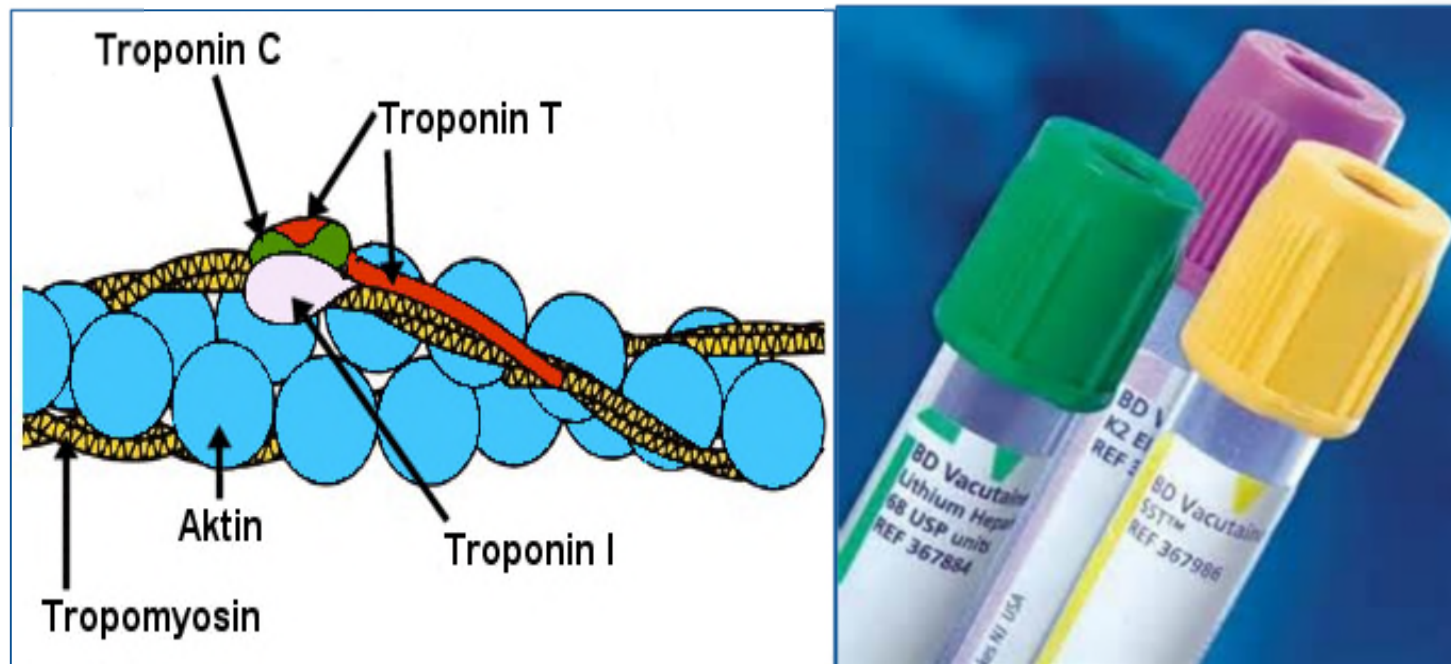
- FO
R1 In patients with chest pain or other symptoms suggestive of ACS, a 12-lead ECG should be performed and evaluated for ischemic changes within 10 minutes of the patient's arrival at an emergency facility (21). (Level of Evidence: C)

- FO
R1 If the initial ECG is not diagnostic but the patient remains symptomatic and there is a high clinical suspicion for ACS, serial ECGs (e.g., 15- to 30-minute intervals during the first hour) should be performed to detect ischemic changes. (Level of Evidence: C)

Troponin



Serial
Troponins



Troponin Class I



- FOR Serial cardiac troponin I or T levels (when a contemporary assay is used) should be obtained at presentation and **3 to 6 hours** after symptom onset in all patients who present with symptoms consistent with ACS to identify a rising and/ or falling pattern of values (Level of Evidence: A)
- FOR Additional troponin levels should be obtained beyond 6 hours after symptom onset in patients with normal troponin levels on serial examination when changes on ECG and/ or clinical presentation confer an intermediate or high index of suspicion for ACS (Level of Evidence: A)

Contemporary Troponin



2012 Universal 3rd Definition of MI clearly indicates that CK-MB is no longer appropriate for current clinical practice

2014 NSTEMI Guidelines - With the availability of cardiac troponin, CK-MB, myoglobin, and other diagnostic biomarkers are no longer necessary

Myoglobin - not used

ACEP's clinical policy recommends against using a single value within 6 hours of symptom onset to exclude AMI. For patients presenting more than 6 to 8 hours after onset of the most recent episode of pain, a single negative cardiac marker is often adequate to exclude AMI (but not unstable angina) in the patient with possible ACS.

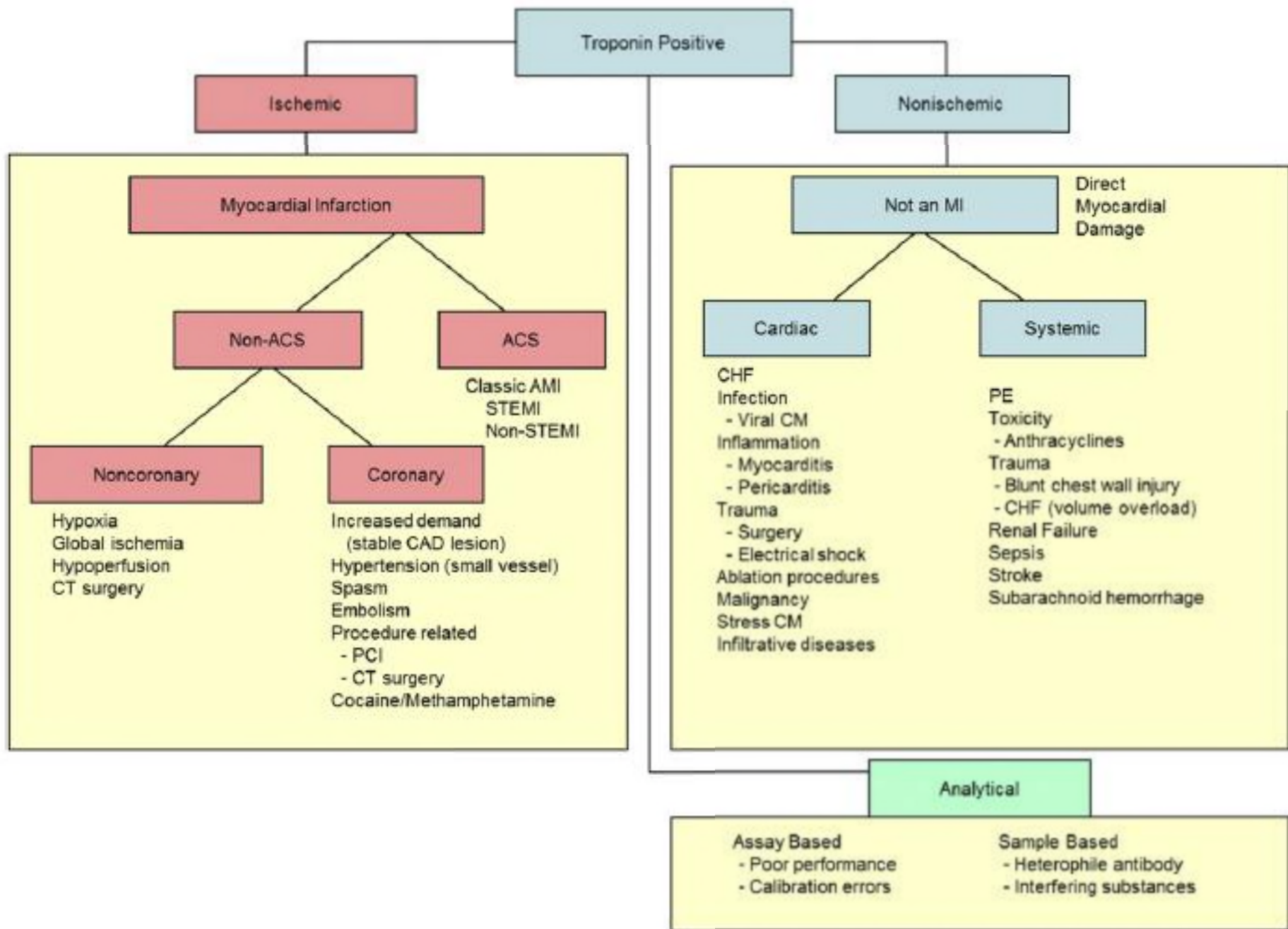
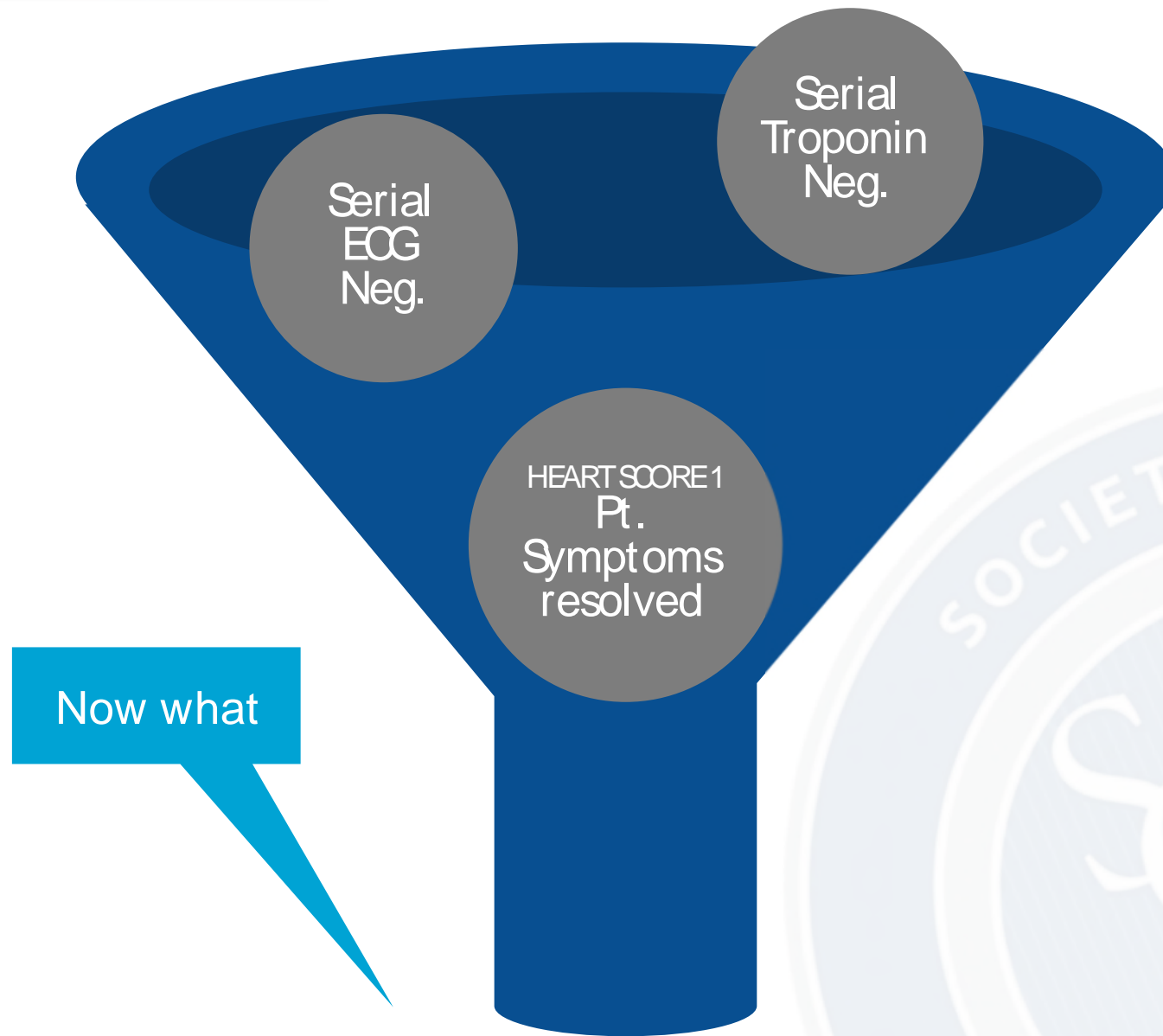


Figure 1. Conceptual Model for Clinical Distribution of Elevated Troponin

Now What ??



DESIGN:

45416 patients (11230 met criteria) blind study obtained from a prospectively collected database enrolling adult patients admitted or observed with the following inclusion criteria:

- (1) primary presenting symptom of chest pain, chest tightness, chest burning, or chest pressure and
- (2) negative findings for serial biomarkers

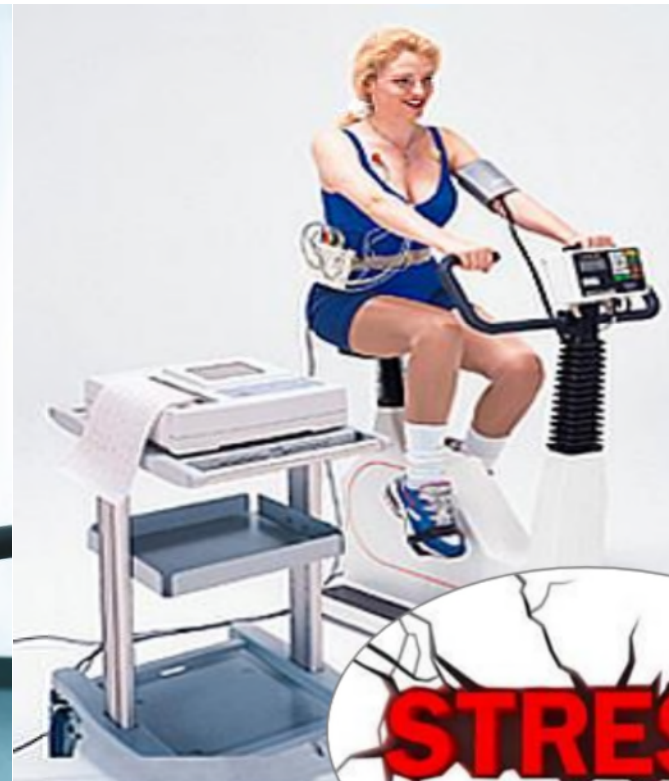
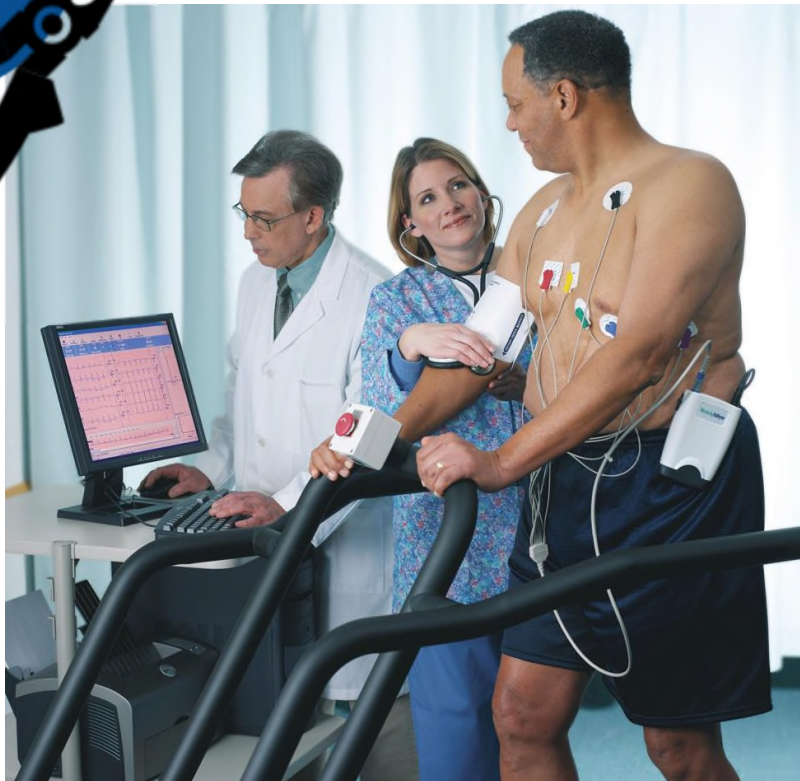
The primary outcome was a composite of life-threatening arrhythmia, inpatient ST-segment elevation myocardial infarction, cardiac or respiratory arrest, or death during hospitalization.

CONCLUSIONS AND RELEVANCE In adult patients with chest pain admitted with 2 negative findings for serial biomarkers, nonconcerning vital signs, and nonischemic electrocardiographic findings, short-term clinically relevant adverse cardiac events were rare and commonly iatrogenic, suggesting that routine inpatient admission may not be a beneficial strategy for this group.

What is Left in the Toolbox?



STRESS TEST



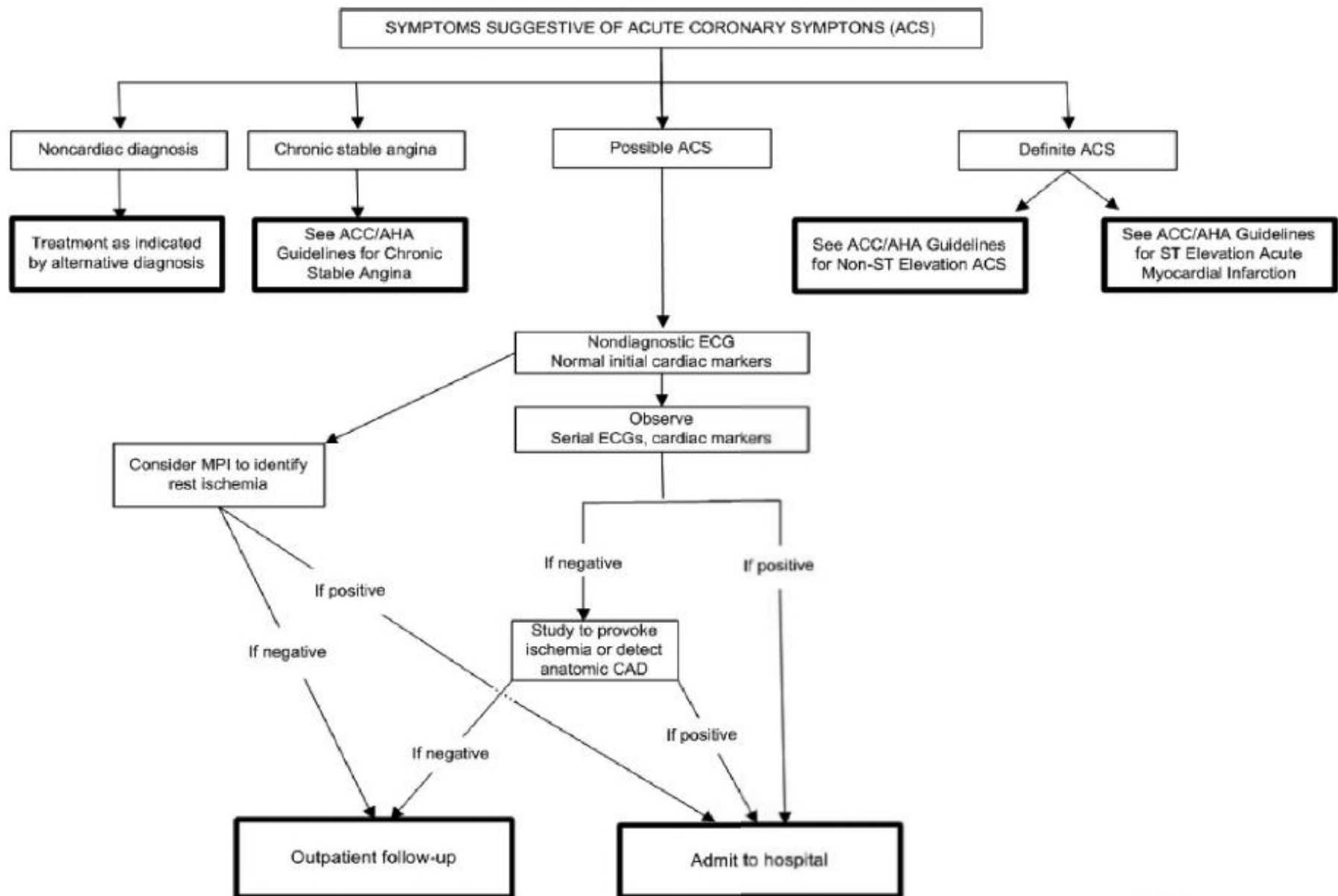


Figure. Evaluation of patients presenting with symptoms suggestive of ACS. ACC indicates American College of Cardiology; AHA, American Heart Association. Adapted from Braunwald et al,¹⁰ with permission from Lippincott Williams & Wilkins. Copyright 2000, American Heart Association.

Testing of Low Risk Patients



- FO
R1 Patients present to the emergency department with non-ischemic ECG and no prior CAD the frequency of an MI was 2%
- FO
R1 If the patient has a history of CAD the rate is 4%
- FO
R1 A normal or minimally abnormal ECG may be associated with non-ST elevated MI in 1-6% of patients
- FO
R1 Testing of low-risk patients presenting to the emergency department

Testing of Low Risk Patients



Cardiac stress tests done with imaging have risen substantially and more than a third appeared inappropriate, according to a national study.

- FO
R1 While the annual frequency of cardiac stress testing stayed constant after adjustment for other factors, the proportion done with imaging rose from 59% in 1993-1995 to 87% in 2008-2010, Joseph A. Ladapo, MD, PhD, of NYU Langone Medical Center in New York City.
- FO
R1 "At least 34.6% were probably inappropriate, with associated annual costs and harms of \$501 million and 491 future cases of cancer," as reported in the Oct. 7 issue of the Annals of Internal Medicine.

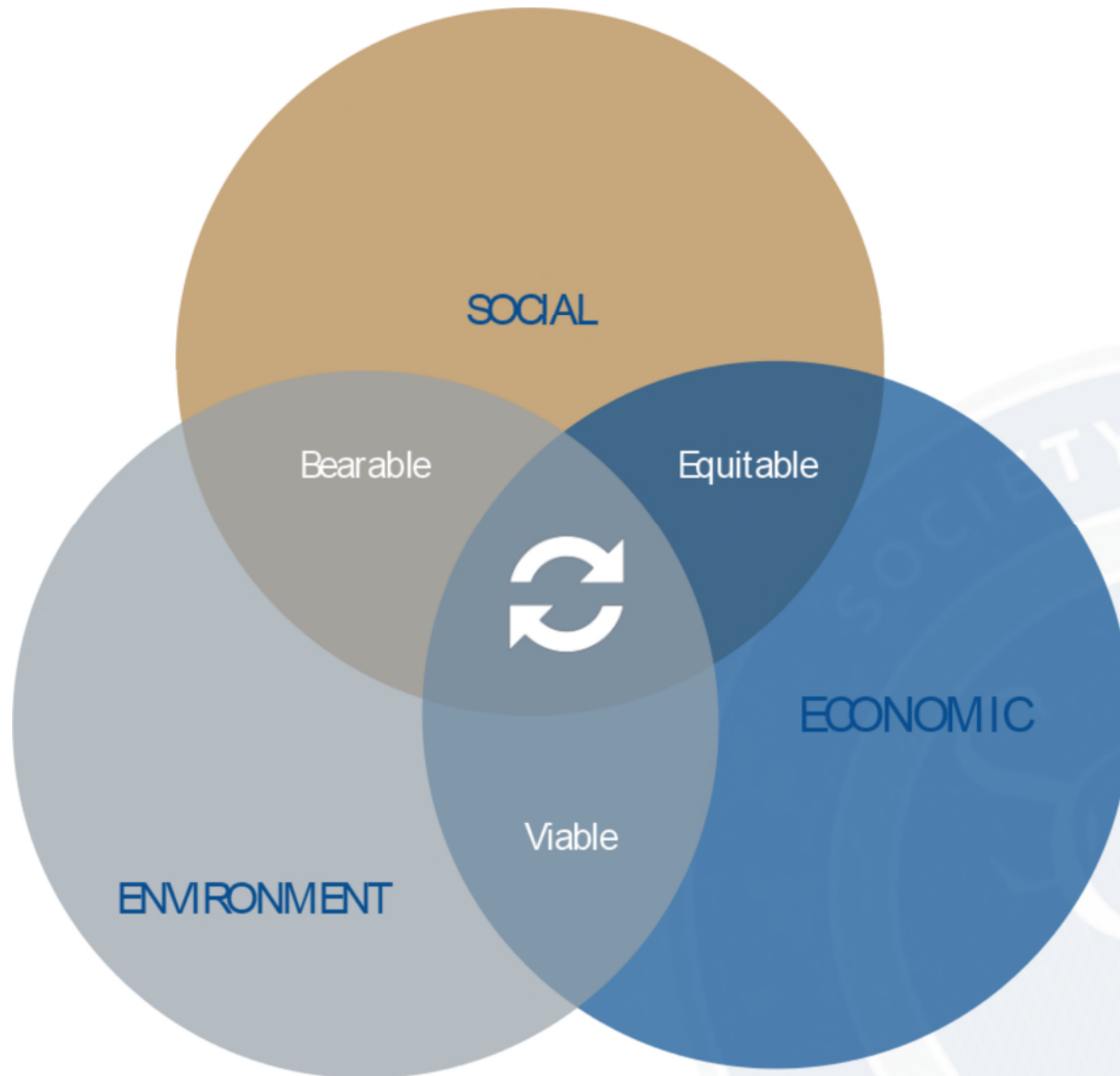
Study of National Hospital Ambulatory Medical Care Survey data from 1993-2010



Where the rubber hits the road



Social Economic Factors



Social Economic Factors



- FO
R1 Does the patient have the means to return to the hospital for testing?
 - Transportation
 - Intellect
- FO
R1 Does the patient have the means to follow up?
 - PCP
- FO
R1 Is the patient compliant ?
 - Frequent guest

No to any of these questions = observation



It is reasonable to observe patients with symptoms consistent with ACS without objective evidence of myocardial ischemia (nonischemic initial ECG and normal cardiac troponin) in a chest pain unit or telemetry unit with serial ECGs and cardiac troponin at 3- to 6-hour intervals (Level of Evidence: B)



What is Observation Care?



Observation care is a well-defined set of specific, clinically appropriate services that include ongoing short term treatment, assessment, and reassessment before a decision can be made regarding whether patients will require further treatment as hospital inpatients or if they are able to be discharged from the hospital.



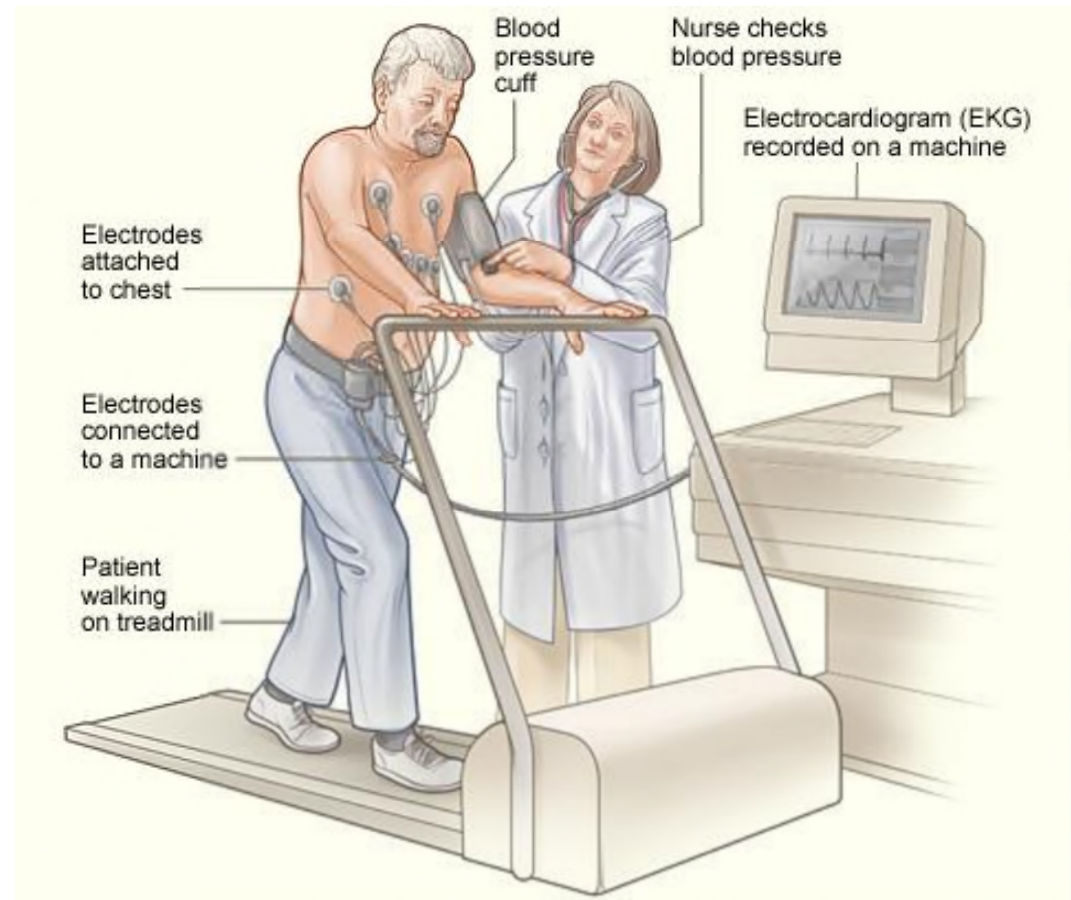
Observation Services was created for **one** reason only

-  To give the clinician more time to make a decision if the patient is safe to go home or if the patient needs inpatient care
-  Benchmark data supports this decision can and should be made in 15-19 hours

Stress Testing



- FO
R1 Availability
- FO
R1 Competency of staff
- FO
R1 Type of test
- FO
R1 Who needs a stress test?
- FO
R1 How often does a patient need a stress test?
- FO
R1 Patient individual needs- ability to exercise, anatomy, etc.



Class Iia

- FO
R1 It is reasonable for patients with possible ACS who have normal serial ECGs and cardiac troponins to have a treadmill ECG (Level of Evidence: A), stress myocardial perfusion imaging or stress echocardiography before discharge or within 72 hours after discharge. (Level of Evidence: B)
- FO
R1 In patients with possible ACS and a normal ECG, normal cardiac troponins and no history of CAD, it is reasonable to initially perform (without serial ECGs and troponins) coronary CT angiography to assess coronary artery anatomy (Level of Evidence: A) or rest myocardial perfusion imaging with a technetium-99m radiopharmaceutical to exclude myocardial ischemia (Level of Evidence: B)



Results:

- FO
R1 Cardiac screening has not been shown to improve patient outcomes. It is also associated with potential harms due to false-positive results because they can lead to subsequent, potentially unnecessary tests and procedures. Cardiac screening is likely to be particularly inefficient in adults at low risk for coronary heart disease given the low prevalence and predictive values of testing in this population and the low likelihood that positive findings will affect treatment decisions.
- FO
R1 High-Value Care Advice: Clinicians should not screen for cardiac disease in asymptomatic, low-risk adults with resting or stress electrocardiography, stress echocardiography, or stress myocardial perfusion imaging.

Roger Chou, MD, for the High Value Care Task Force of the American College of Physicians* Ann Intern Med. 2015;162:438-447. doi:10.7326/M14

TABLE 2.1

Suspected Non-ST-Segment Elevation ACS: Early Assessment Pathway Based on Initial ECG, Biomarker Analysis, and Symptoms

Indication	Echocardiography Rest	CMR Rest	SPECT Rest	CCTA	CCath
Positive initial diagnosis of NSTEMI/ACS					
3. Initial ECG and/or biomarker analysis unequivocally positive for ischemia	R	R	R	R	A
Equivocal initial diagnosis of NSTEMI/ACS					
4. Equivocal initial troponin or single troponin elevation without additional evidence of ACS	M*	M*	A	A	R
5. Ischemic symptoms resolved hours before testing	R	M	M*	A	R
Low/intermediate likelihood initial diagnosis of NSTEMI/ACS					
6. TIMI risk score = 0, early hsTrop negative	R	R	R	A	R
7. Normal or nonischemic on initial ECG, normal initial troponin	R	R	M*	A	R

Appropriate use key: A = appropriate; M = may be appropriate with rating panel consensus; M* = may be appropriate as determined by lack of consensus by rating panel; R = rarely appropriate.

ACS, acute coronary syndrome; CCath, catheter-based coronary angiography; CCTA, coronary CT angiography; CMR, cardiovascular MR; ECG, electrocardiography; hsTrop, high-sensitivity troponin T; NSTEMI, non-ST-segment elevation myocardial infarction; SPECT, single-photon emission computed tomography; TIMI, Thrombolysis in Myocardial Infarction.

2015 ACR/ACC/AHA/AATS/ACEP/ASNC/NASCI/SAEM/SCCT/SCMR/SOPC/SNMMI/STR/STS
 Appropriate Utilization of Cardiovascular Imaging in Emergency Department Patients With Chest Pain
 A Joint Document of the American College of Radiology Appropriateness Criteria Committee and
 the American College of Cardiology Appropriate Use Criteria Task Force

Patient Engagement



Decision
Aide



Engage Patient in Shared Decision Making



TWO STUDIES

- Both demonstrated when physicians engaged patients most choose to go home and follow up with PCP or cardiologists within 72 hours
- No adverse events in either study.

STUDY:

- Calculate the patient's short-term risk for an adverse cardiac event.
- Select the decision aid that most conservatively estimates the patient's risk for an adverse cardiac event
- Write the patient's name on the upper left hand corner of the decision aid.
- Sitting beside the patient with the decision aid oriented so the patient can follow along, walk the patient through the rationale for and results of initial testing and reassure the patient that testing so far indicates that they are NOT having a heart attack

Engage Patient in Shared Decision Making



- FO
R1 Explain that a stress test may help determine more precisely their future risk for a heart attack or pre-heart attack (i.e., acute coronary syndrome) and show the patient their personalized risk estimate for a heart attack or pre-heart attack using natural frequencies and the pictogram.
- FO
R1 List out the management options for the patient. The physician can either neutrally list out the options if she feels that there is equipoise and all are equally safe or recommend a specific option if, based on her gestalt, one option is preferred over another.
- FO
R1 Work with the patient to come to a decision, offering the degree of support that seems best for the patient at that moment.
- FO
R1 Leave the decision aid with the patient for them to refer to in the future if needed.

What is Left in the Toolbox?



Summarize



	Home w/ follow up	Observation
Gestalt – I think this might be cardiac	No	Yes
Risk Stratification- low	Yes	Yes
ECG Negative	Yes	Yes
Troponin Negative	Yes	Yes
Patient compliance-ability to F/U	No	Yes
Stress testing type and timelessness	Maybe – if F/U appointment is timely	Yes
Patient joint decision go home	Yes	No

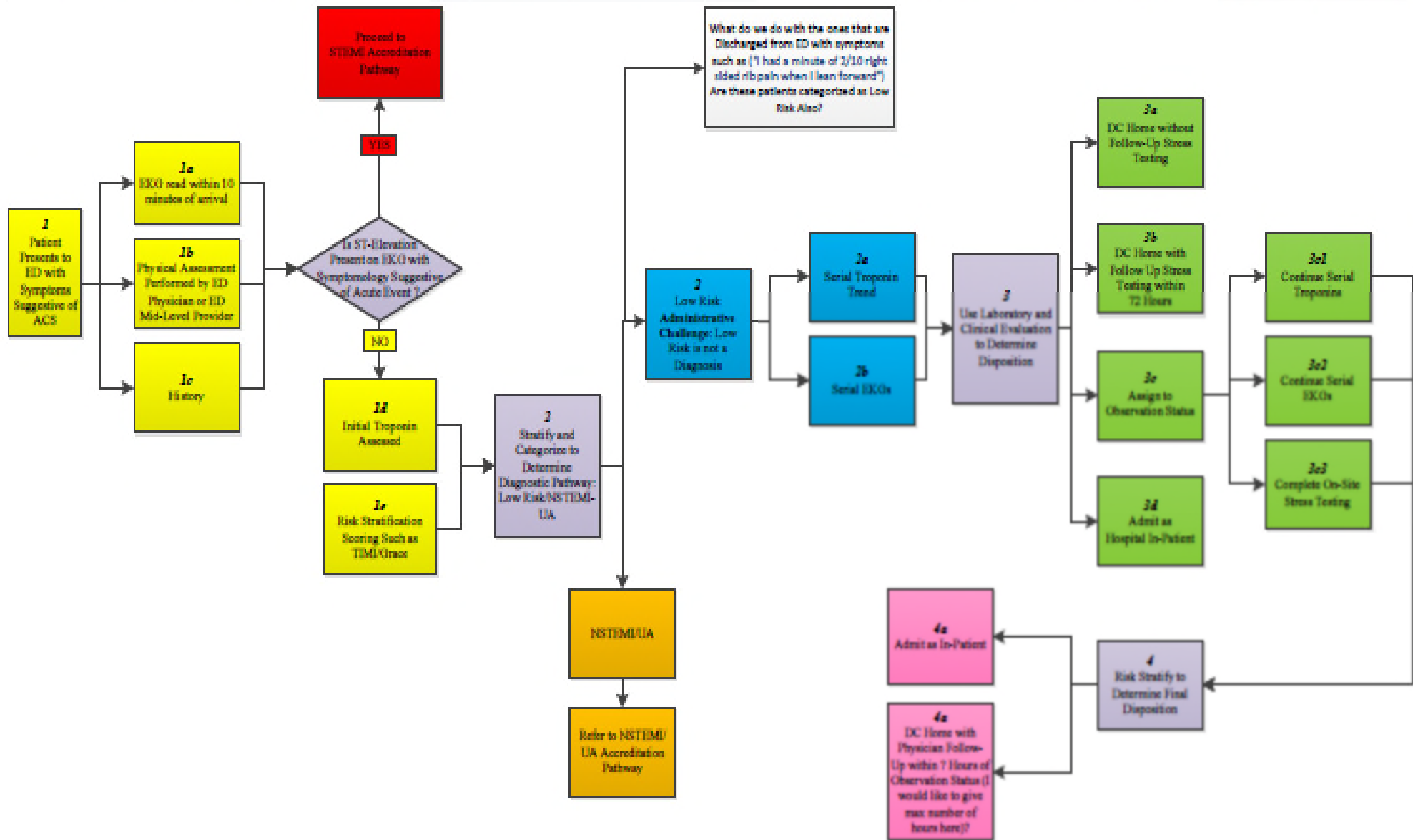
How to Implement at Your Facility?



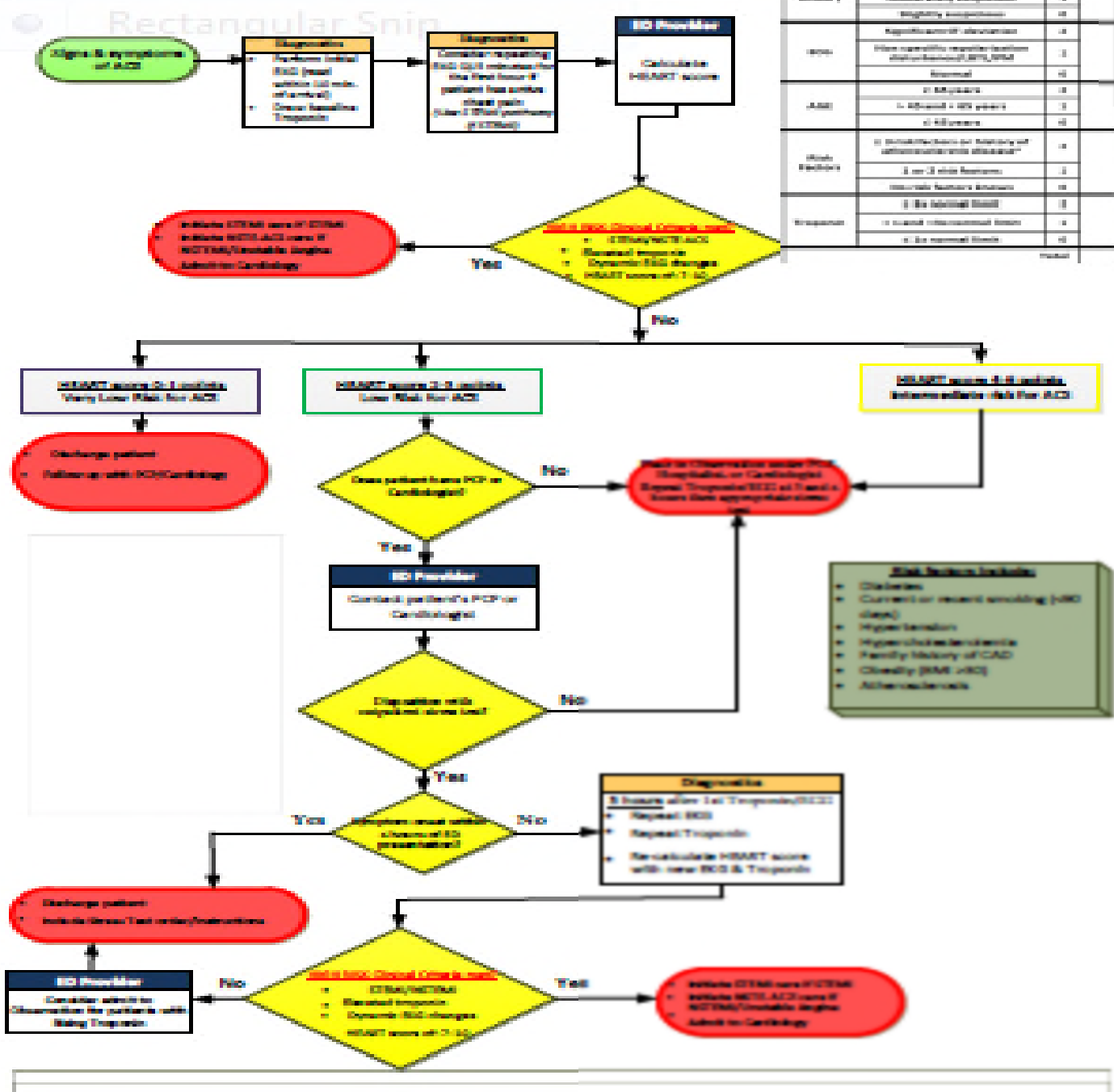
- FO**
H1
- Assess available resources
- Include timely follow up and with whom (define)
 - Timely stress testing
 - Physician buy-in
 - Flowcharts/ processes
 - Clinical pathways
 - Metrics
 - Need data to ensure process changes are effective and safe

Location of Care: ED
Managed by ED Physician/Mid-Level

Potential Locations of Care for the Low Risk Patient: ED/Observation Unit/In-Patient/Discharged Home
Managed by: Admitting Physician from Emergency/Cardiology/Internal Medicine/Hospitalist



ECG Risk Stratification for Patients with Possible ACS



HSRAT score for chest pain/possible ACS		
History	Highly suspicious	3
	Moderately suspicious	2
	Highly suspicious	0
ECG	Appropriate ST elevation	3
	Non-specific ST/T changes (ST/ST-T/ST/ECG)	1
	Normal	0
Age	> 65 years	3
	45-64 years	1
	< 45 years	0
Risk Factors	3 (Diabetes or history of atrioventricular blockage)	3
	1 or 2 risk factors	1
	No risk factors known	0
Response	1 to 3rd Serial ECG	3
	1 to 2nd Serial ECG	1
	1 to 1st Serial ECG	0

- Other Risk Factors include:**
- Diabetes
 - Current or recent smoking (>10 cigs)
 - Hypertension
 - Hypercholesterolemia
 - Family history of CAD
 - Obesity (BMI >30)
 - Atherosclerosis

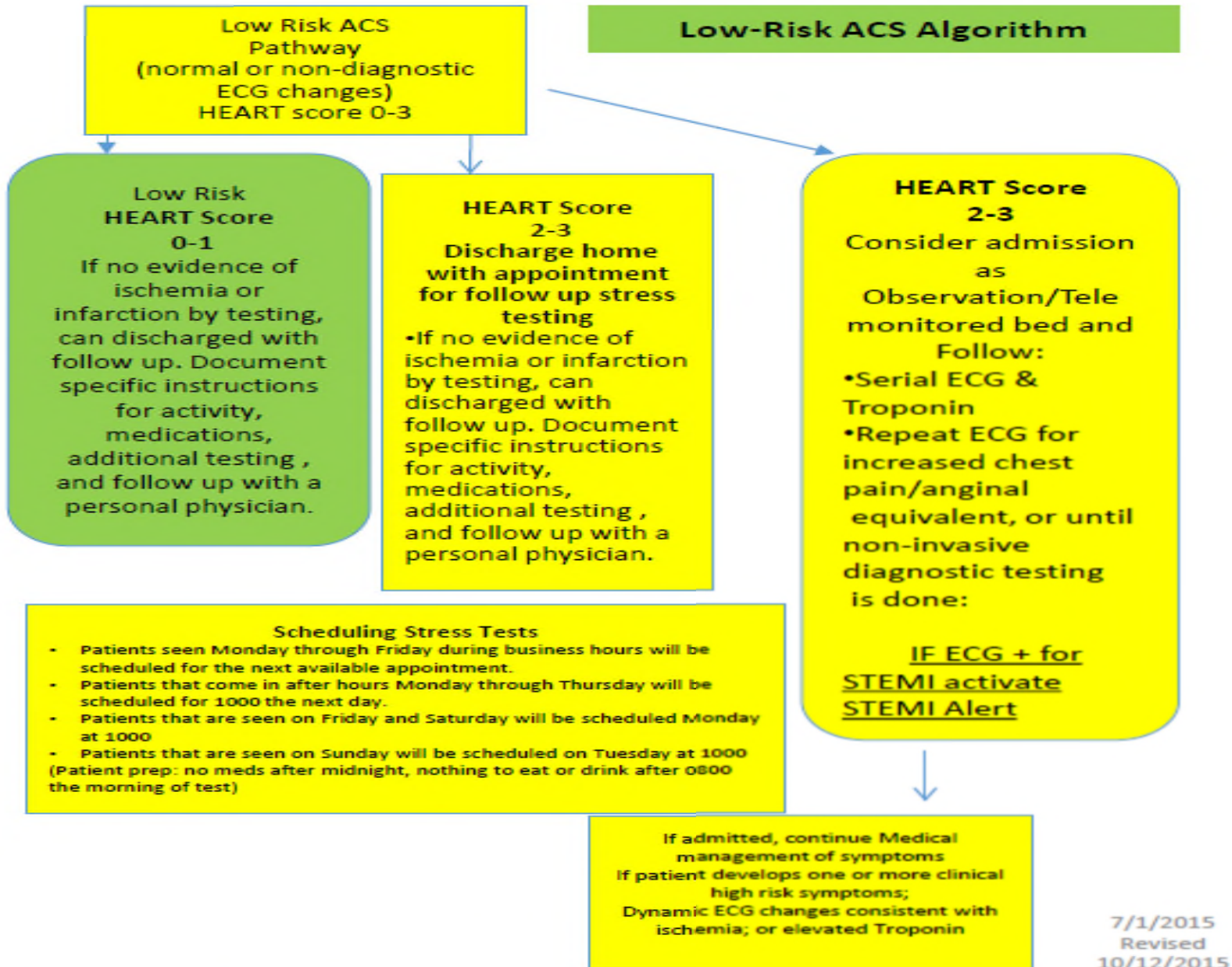
Clinical Pathways



ED - ACUTE CORONARY SYMPTOMS RISK STRATIFICATION

Diagnosis	STEMI	Unstable Angina/ Non STEMI	Possible Angina/ACS	Low Risk - No Assignable Cause	Ultra Low Risk	Notes
Clinical	Acute MI	Highly Suspicious	Suspicious	Atypical History	Atypical History - Symptoms > 6 hours	ED Provider documents the time the EKG was read on the paper EKG with time, STEMI Yes or No and Initials. If First EKG is not diagnostic for STEMI and pt remains symptomatic monitor patient continuously
EKG < 30 minutes	EKG given to ED Provider Immediately	Abnormal EKG Positive Hx MI, PCI, CABG EKG given to ED Provider Immediately	Negative EKG Positive CAB risk factors	Negative EKG	Negative EKG	
Goals	Admit to STEMI Door to Transfer < 30 minutes Door to Catheters < 90 minutes	Risk Stratify: High Risk Timi Risk Score = ≥ 3	Risk Stratify: Moderate Risk Timi Risk Score = 2	Risk Stratify: Low Risk Timi Risk Score = 0-1	Risk Stratify Low Risk Timi Risk Score = 0	TIMI RISK SCORE FACTORS Age ≥ 65 years Yes +1 ≥ 3 Risk Factors for CAD Yes +1 Known CAD stenosis ≥ 50% Yes +1 ASA Use in Past 7d Yes +1 Severe Angina ≥ 2 episodes in past 24 hours Yes +1 ST changes ≥ 0.5 mm Yes +1 + Cardiac Markers Yes +1
Tests	CBC, CMP, PT/INR, Magnesium Troponin I CK CXR EKG	CBC, CMP, PT/INR, Magnesium Troponin (I) (3 hr) (6 hr) CK (I) (3hr) (6hr) CXR EKG (I) (6 hr)	CBC, CMP, PT/INR, Mag Troponin (I) (3 hr) (6 hr) CK (I) (3hr) (6hr) CXR EKG (I) (6 hr)	CBC, CMP, PT/INR, Mag Troponins (I) (3hr) (6 hr) CK (I) (3hr) (6hr) CXR EKG (I) (6 hr)	Troponin at 0 hour EKG (I) (3 hr) CK (I) (3hr)	
Medications	ASA 324 mg Chewed Consider: Heparin IV Bolus Metoprolol PO or IV NTG PRN Morphine IV	ASA 324 mg Chewed Consider: Heparin IV Bolus or drip Metoprolol PO or IV NTG PRN Morphine IV	ASA 324 mg chewed Consider: NTG PRN Morphine IV Metoprolol PO or IV	ASA 324 mg chewed Consider: NTG PRN Morphine IV	Consider: ASA 324 mg chewed	
Disposition	Cath Lab or Transfer Admit to OBS for Cath Lab Patients	Monitored Bed/Cath lab (SDU) Admit to Inpatient or OBS for Cath lab	Observation SDU	Observation Tele Unit	Discharge from ED Follow up with PCP in 72 hours	
		Change to STEMI Diagnosis if EKG consistent with STEMI	Change to UA/NSTEMI pathway if EKG consistent with NSTEMI. Change to STEMI Diagnosis if EKG consistent with STEMI	Change to High Risk if EKG shows ischemia and/or Biomarkers Positive. Change to STEMI Diagnosis if EKG consistent with STEMI	Change to High Risk if EKG shows ischemia and/or Biomarkers Positive. Change to STEMI Diagnosis if EKG consistent with STEMI	

Flowcharts



Questions ?



CONTACT INFORMATION

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