Evolving Field of Acute Coronary Syndrome

- Cindy Baker, MD FACC
- Associate Professor Division of Cardiovascular Medicine OSUWMC
- Medical Director of Interventional Program and Cardiac Catheterization Laboratory at Memorial Hospital

The Ohio State University Wexner Medical Center

1

- **Outline**
  - **Diagnosis and Etiology**
  - **Algorithms of Care**
  - **Revascularization Recommendations**
  - **Imaging advancements**
  - **Antiplatelet updates**
  - **Statin/ non-statin therapy**

2

Acute Coronary Syndrome

Unstable Angina | NSTEMI | STEMI

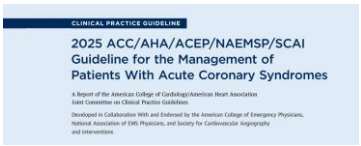
Each year, an estimated 1.2 million individuals in the U.S. are hospitalized with ACS. STEMI accounts for about 30% of these hospitalizations, while NSTE-ACS accounts for the remaining 70%

The Ohio State University Wexner Medical Center

3

HOT of the press!!

- Combines STEMI and NSTE-ACS guidelines
- Updates recommendations for revascularization techniques, timing, antiplatelet and cholesterol Rx
- Comparable to the ESC guidelines released in 2023

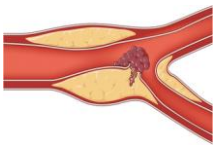


The Ohio State University Wexner Medical Center

4

Definition and Classification

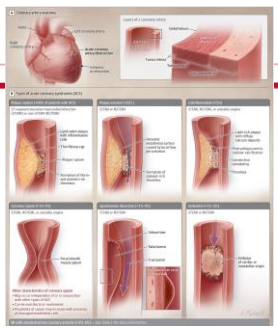
Acute Coronary Syndromes are typically caused by the disruption (rupture or erosion) of an unstable coronary artery atherosclerotic plaque with associated partial or complete coronary artery thrombosis and/or microemboli, resulting in diminished blood flow to the myocardium and subsequent myocardial ischemia



Sunil V. Rao et al. JACC 2025;

The Ohio State University Wexner Medical Center

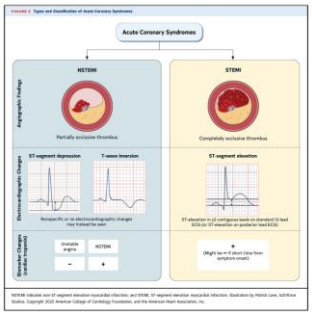
5



- **Plaque rupture and erosion account for 85% of ACS cases**
- **Other far less common etiologies include:**
  - **Calcified nodules**
  - **Coronary vasospam**
  - **SCAD**
  - **Embolism**

The Ohio State University Wexner Medical Center

6



Sunil V. Rao et al. *JACC* 2025;

The ESC guideline offers an easy-to-remember "A.C.S." acronym for initial triage and assessment:

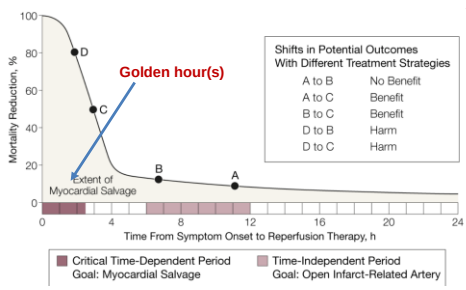
- **A stands for an abnormal ECG, which should be performed within 10 minutes of first medical contact**
- **C for clinical context, considering symptom presentation and any patient history available**
- **S for clinical stability, which is crucial for immediate care decisions**

Algorithm for care in patients presenting with concern for ACS

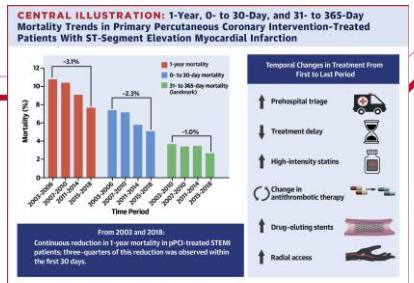
Take home message has not changed for STEMI

FMC to device ≤ 90 minutes

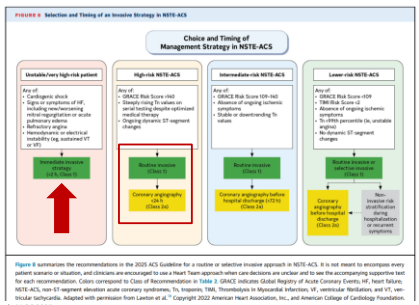
Sunil V. Rao et al. *JACC* 2025;



Gersh B, et al. JAMA 2005 293: 8

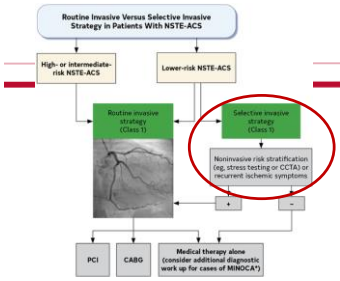


Thrane PG, et al. J Am Coll Cardiol. 2023;82(10):e017159.



In patients with NSTE-ACS who are scheduled for invasive strategy with timing> 24 hrs, upstream Rx with clopidogrel or ticagrelor maybe considered to reduce MACE

Sunil V. Rao et al. *JACC* 2025;



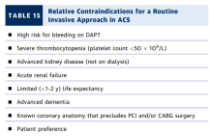


TABLE 15 Relative Contraindications for a Routine Invasive Approach in ACS

- High risk for bleeding on DAPT
- Severe thrombocytopenia (platelet count <50 × 10^9/L)
- Advanced kidney disease (not on dialysis)
- Acute renal failure
- Limited (<1-2 y) life expectancy
- Advanced dementia
- Known coronary anatomy that precludes PCI and/or CABG surgery
- Patient preference

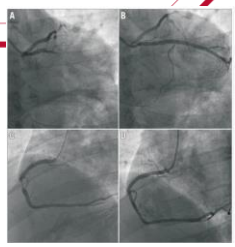
Sunil V. Rao et al. JACC 2025;

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

13

Management of Multi-Vessel CAD

- Guidelines recommend treating the culprit lesion and significant non-culprit lesions either during the index procedure or during hospitalization.
- Reduces the risk of death or MI and improves angina-related quality of life (QOL)
- This applies for both STEMI and NSTEMI
- **For patients with evidence of cardiogenic shock only the culprit lesion should be treated. PCI of the non-infarct vessel increases risk of death and renal failure**



THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

14

Management of Multi-Vessel CAD

TABLE 16 Considerations for Choice of Coronary Revascularization Strategy for Patients With NSTE-ACS and MVD

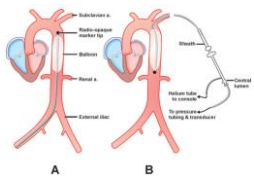
In patients with NSTE-ACS and MVD, CABG surgery may be preferred over multivessel PCI in any of the following situations:

Significant left main coronary stenosis with high-complexity CAD
Multivessel CAD with complex or diffuse CAD
Diabetes mellitus and MVD with the involvement of the LAD
Multivessel CAD or complex left main CAD with severe left ventricular dysfunction

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

15

Cardiogenic Shock and Indication for MCS (mechanical circulatory support)

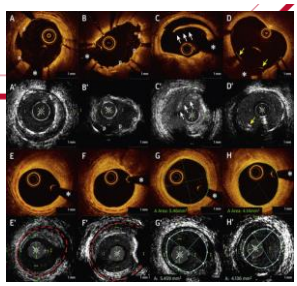


THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

16

Imaging Updates

Intra coronary imaging with IVUS or OCT is suggested to optimize coronary intervention.



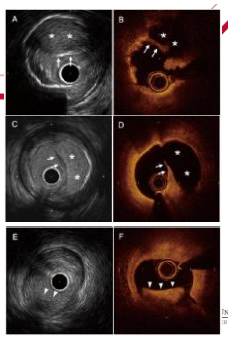
Marcos Garcia-Guimaraes et al. *J Am Coll Cardiol Img* 2019; 13:519-521.

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

17

Imaging Updates

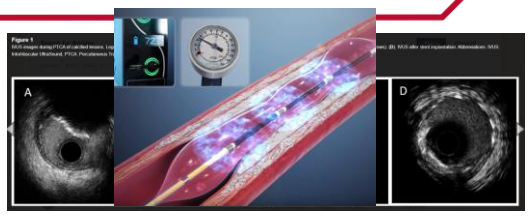
Intra coronary imaging is also helpful to assess coronaries that appear angiographically normal or non-obstructive in the setting of ACS.



THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

18

Imaging Updates



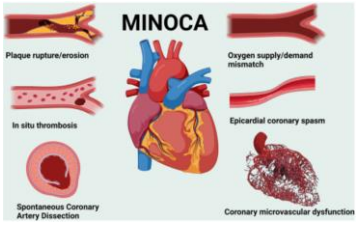
Arora P, et al. Ultrasonic Imaging 2023;45:136-150.

The Ohio State University Wexner Medical Center

19

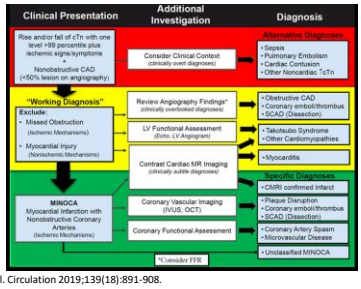
MINOCA- myocardial infarction with non-obstructive coronary arteries

- Prevalence of MINOCA 5% to 6% of myocardial infarctions (higher in certain groups)
- Women presenting with AMI are more than twice as likely as men to have MINOCA



20

MINOCA- Myocardial Infarction With Non-Obstructive Coronary Arteries



Tamis-Holland JE, et al. Circulation 2019;139(18):891-908.

21

Coronary OCT and Cardiac MRI to Determine Underlying Causes of MINOCA in Women

Harmony Reynolds MD
on behalf of the HARP Investigators:

Akiko Maehara MD, Raymond Kwong MD, Tara Sedlak MD, Jacqueline Saw MD, Nathaniel Smilowitz MD, Ehtisham Mahmud MD, Janet Wei MD, Kevin Marzo MD, Mitsuaki Matsumura, Ayako Seno MD, Anais Hausvater MD, Caitlin Giesler MD, Nisha Jhalani MD, Catalin Toma MD, Bryan Har MD, Dwithiya Thomas MD, Laxmi Mehta MD, Jeffrey Trost MD, Puja Mehta MD, Bina Ahmed MD, Kevin Bainey MD, Yuhe Xia, Binita Shah MD, Michael Attubato MD, Sripal Bangalore MD, Louai Razzouk MD, Ziad Ali MD DPhil, Noel Bairey Merz MD, KI Park MD, Ellen Hada, Hua Zhong PhD, Judith Hochman MD

AHA SFRN Funded Research
Sarah Ross Soter Center for Women's Cardiovascular Research

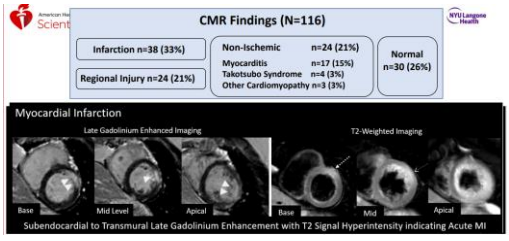
NYU Langone Health

#AHA20

American Heart Association. Scientific Sessions

22

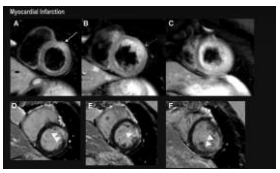
Cardiac MRI in MINOCA

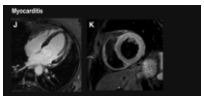


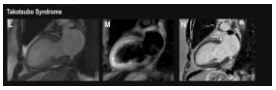
Reynolds H, et al. Circulation 2020;143(7):624-640.

23

Cardiac MRI can be useful to evaluate for myocardial ischemia, infarct, regional or global myocarditis.



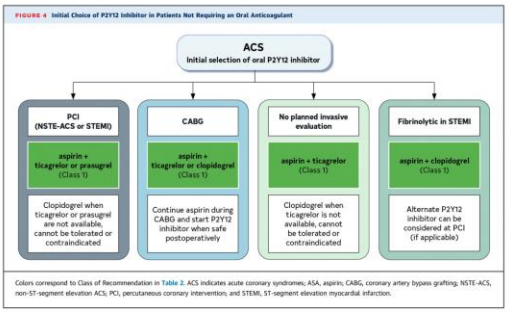




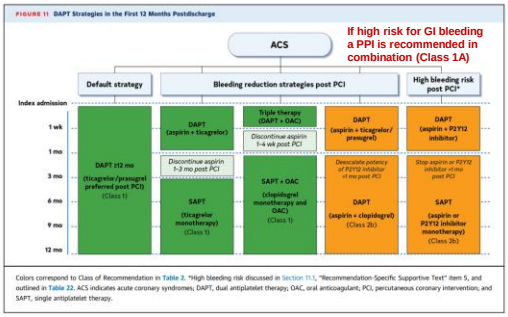
Reynolds H, et al. Circulation 2020;143(7):624-640.

The Ohio State University Wexner Medical Center

24



25



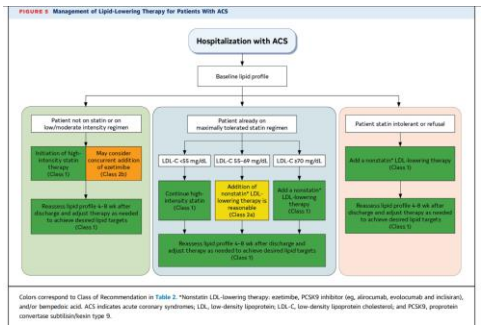
26

Factors associated with an increased bleeding risk after percutaneous coronary intervention

Urban P, et al. Circulation 2019;140(3):240-261.

The Ohio State University Wexner Medical Center

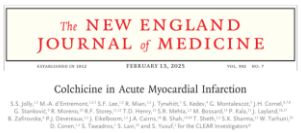
27



28

Use of Chronic Colchicine

- **New guidelines give low-dose colchicine 2b recommendation.**
- **Maybe reasonable to reduce risk of MACE**



RCT ~7K patients with median 3 yr follow up did not show lower incidence of MACE.

The Ohio State University Wexner Medical Center

29

Conclusions

- **New guidelines for ACS incorporate recommendations for STEMI, NSTEMI and USA**
- **Continued strong recommendation for FMC to device time <90 minutes**
- **Non-culprit vessel PCI recommended for patients with multivessel disease either during index procedure or hospitalization to reduce MACE except in those with CS**
- **Routine use of MCS with CS not recommended**
- **Timing of invasive strategy determined by degree of risk**
- **Intravascular imaging recommended to optimize stent placement and assess cases of MINOCA**
- **Cardiac MRI invaluable tool to evaluate MINOCA**
- **Antiplatelet therapy for ACS should be personalized for each patient based on risk assessment**
- **Aggressive lipid management recommended with goal LDL< 55**

The Ohio State University Wexner Medical Center

30

Thank You!

The Ohio State University
Wexner Medical Center

31