

CARDIAC MONITOR

Winter 2013 / mercyheartsacramento.org

Acute Coronary Syndrome: Early Intervention is Key

By Scott Baron, MD

Acute Coronary Syndrome (ACS) is a diagnosis covering any condition brought on by sudden, profound supply demand inequity in the blood flow to the heart. Included in the diagnosis of ACS are ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), and unstable angina (USA). ACS typically occurs when atherosclerotic plaque ruptures, resulting in thrombosis of the infarct-related artery, which causes variable degrees of obstruction and downstream compromise to flow. About 20% of the time, erosion of the arterial surface, in the absence of plaque rupture, may lead to thrombus

formation and obstruction. Less frequently, ACS may be related to high cardiac demand with fixed, impaired coronary blood supply.

Causes and Indications

On some occasions, the Acute Coronary Syndrome may be clinically asymptomatic or may not present with classic cardiac symptoms like chest pain. Rather, patients may report neck, jaw, ear, tooth or arm pain; or shortness of breath; weakness; light-headedness; diaphoresis; or nausea. Women, in particular, and diabetics are more likely to experience atypical coronary symptoms and should be given special consideration. PET

scanning with dipyridamole stress may unmask microvascular disease in women, a not infrequently overlooked cause of coronary ischemia presenting with atypical symptoms.

Because early treatment for ACS can be effective and prevent further cardiovascular damage, physicians are encouraged to consider ACS, especially when evaluating women, patients with diabetes, older patients, patients with dementia, and those with a history of heart failure.

Therapy and Treatment

According to the 2011 American College of Cardiology Foundation/

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Antiplatelet Drug Selection for Post Acute Coronary Syndrome

By Annie Kong, 4th-Year Pharmacy Student

Three antiplatelet drugs are currently marketed for Acute Coronary Syndrome (ACS). Collectively known as P2Y₁₂ receptor blockers, these drugs are differentiated by efficacy, safety, cost, and patient adherence to therapy.

Clopidogrel is the only P2Y₁₂ blocker that is generically available. The two other agents, prasugrel and ticagrelor, are still costly brand-only products. Both prasugrel and ticagrelor showed statistically significant reductions in primary efficacy endpoints (CV death, nonfatal myocardial infarction, and nonfatal stroke) compared

to clopidogrel in the TRITON-TIMI-38 and PLATO trials. However, higher rates of bleeding were seen for both prasugrel and ticagrelor compared to clopidogrel in the trials.

For prasugrel, patients with risk factors such as age \geq 75 years and body weight $<$ 60 kg showed higher rates of bleeding. The FDA also contraindicated prasugrel use in patients with history of transient ischemic attack or stroke or with active pathological bleeding, while clopidogrel and ticagrelor have FDA warnings against use in patients with active bleeding or

history of intracranial hemorrhage.

Although ticagrelor is more effective in reducing primary efficacy endpoints compared to clopidogrel, its twice-daily dosing may contribute to adherence problems for patients. Clopidogrel and prasugrel are both dosed once daily. Also, during the PLATO trial, higher rates of adverse events such as dyspnea occurred in patients treated with ticagrelor, resulting in higher discontinuation rates.

Because of the many differences in the three antiplatelet agents, patient-specific needs dictate drug choice for your patient.



Innovation and Collaboration Lead to Survival Stories

Every year, tens of thousands of lives are touched by the work done at Mercy Heart & Vascular Institute. Mercy's extensive cardiac care network stretches from the primary care and emergency care found at Mercy hospitals in local communities to the advanced services and technologies available at **Mercy General Hospital** and **Mercy San Juan Medical Center**. The innovation and collaboration found within this network creates new stories of survival every day... Here are a few.

An Active Life Stalled By a Hidden Problem

Lori Wisniewski lived an active, healthy life... When she began to feel strange sensations in her chest, she took it seriously. She saw a doctor affiliated with **Sierra Nevada Memorial Hospital** in Grass Valley, who referred her to Frank Slachman, MD, at **Mercy General** who found something that Lori had unknowingly been living with since birth – a large hole in her heart.

The hole – which was in a precarious spot, near a valve – had to be repaired. Dr. Slachman recommended an innovative procedure using two advanced technologies: the daVinci robotic-assisted surgical system and CorMatrix ECM. CorMatrix is a cardiac tissue regeneration material that, once placed on the heart, promotes the regeneration of the patient's own cells to aid in healing. By using the minimally invasive daVinci system to place the CorMatrix on Lori's heart, Dr. Slachman was able to avoid open heart surgery, allowing her a quicker and easier recovery.

Within weeks Lori was back to her usual activities, including a triathlon with friends and family to celebrate her healthy heart.

Former Nurse Saves Her Daughter with CPR

Kim Hansen was excited to celebrate her birthday last spring with her elderly mother and the rest of their family. However, just minutes after her mother arrived at her Folsom home, 51-year old Kim collapsed. Her mom, Audrey Dufault, checked her pulse and found nothing.

Audrey had spent 33 years inside the cardiac operating rooms of Mercy General Hospital as a Registered Nurse before retiring in 1992. Despite the shock of finding her own daughter with no pulse, she was able to perform CPR, keeping her daughter alive until paramedics arrived.

Kim was transported to **Mercy Hospital of Folsom** before being transferred to **Mercy General Hospital**. There, Walt Marquardt, MD, found a critical area of blockage in the artery supplying the front wall of the heart which had caused Kim's ventricular fibrillation – a life-threatening heart rhythm. Dr. Marquardt placed two stents and, after a brief hospital stay, Kim returned home and back to work.

Kim is focused now on maintaining her heart health and enjoying every day with her family, including her lifesaving mother.

History-Making Aviator Gets Second Chance

As a young man, Milford Craig was a member of the Tuskegee Airmen – the first African American aviators to serve in the US military. He carried out his childhood dream of being a pilot, despite segregation and racism, and served for many years before retiring to Sacramento.

Milford was 85 years old when he began experiencing fainting spells. Following a trip to the **Methodist Hospital** Emergency Department, Milford was diagnosed with aortic stenosis – narrowing of the aortic valve in the heart. An active man, Milford refused to be incapacitated by his worsening heart condition.

Milford was referred to Kapil Sharma, MD, and Michael Chang, MD at **Mercy General Hospital**, who offered him an innovative solution: Trans-Aortic Valve Replacement (TAVR), a minimally invasive procedure in which the aortic valve is replaced. TAVR is ideal for elderly patients who would not tolerate traditional open heart valve replacement surgery.

Milford underwent his TAVR procedure in May, 2012. Today, he is a healthy 86 year old who walks every day, chops wood and enjoys gardening at his home where he's lived for the past 40 years.

Alex G. Spanos Heart & Vascular Center construction update

Construction continues on the Alex G. Spanos Heart & Vascular Center on the campus of Mercy General Hospital in East Sacramento. Outside, the building façade is getting final touches. Inside, crews have been busy painting, installing casework and finishing the complex web of wiring needed for such high-tech medical center. Watch for more information about grand opening festivities in coming months.



Mercy General Hospital Earns Cardiovascular Care Honors

Truven Health Analytics (formerly Thomson Reuters) has named Mercy General Hospital one of the “50 Top Cardiovascular Hospitals” for 2013. This honor identifies the nation's best cardiovascular care providers by analyzing clinical outcomes for heart failure and heart attacks, as well as coronary bypass surgery and angioplasties.

The study found that the “50 Top Cardiovascular Hospitals” have significantly better 30-day survival rates, maintain lower 30-day readmission rates for heart attack and heart failure patients, and release bypass patients nearly a day sooner than their peers.

Mercy General has also received renewal of its Accredited Chest Pain Center with PCI (percutaneous coronary intervention) designation from the Society of Chest Pain Centers (SCPC). In 2009 Mercy General Hospital became the first Accredited Chest Pain Center in Sacramento.



Acute Coronary Syndrome *(continued from first page)*

American Heart Association guidelines, an early invasive strategy is recommended for high-risk patients with unstable angina or NSTEMI. For lower risk patients, medical therapy is recommended and initially includes aspirin and traditionally heparin. Other antithrombotics may include bivalirudin. Adding clopidogrel or ticagrelor has also shown to improve outcomes. Recent randomized trials show the newer of these drugs may have added benefits. Glycoprotein IIb/IIIa inhibitors, as was shown in the Tactics TIMI 18 trial (2001), for which Mercy Heart & Vascular Institute was an investigative site, may be especially helpful in the higher risk sub-group. Prasugrel, a new thienopyridine antiplatelet agent, or ticagrelor, or the older agent, clopidogrel, have shown benefit in the patients undergoing percutaneous coronary interventions. [See Drug Selection, page 1]

There is still a role for thrombolysis in STEMI patients who cannot be mechanically revascularized in a timely manner. In the catheterization laboratory, aspiration thrombectomy with subsequent coronary stenting may be the optimal treatment and has shown durable outcomes at relatively low risk and very high success rates at Mercy Heart & Vascular Institute. Rarely, coronary bypass emergently may still have a role. Additionally, adjunctive hemodynamic support with percutaneous ventricular assist devices may be able to salvage the rare patient who might otherwise have a mortal outcome.

Patient Education

Increasing public awareness of the typical and atypical presentations of Acute Coronary Syndrome is critical to improving timely diagnosis and treatment of ACS. Simple lifestyle changes (improved diet and increased exercise) can ultimately help reduce recurrences of ACS after initial treatment. Frequent monitoring of blood pressure and cholesterol is recommended. LDL particle count based on the Multiethnic Study of Atherosclerosis may be especially helpful in assessing risk and allow for optimizing lipid lowering to reduce the particle count under 1000.

A cardiac support or rehabilitation program may reinforce education and enhance compliance. For more information about programs available through Mercy Heart & Vascular Institute, call 916.564.2280.

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Referral Resources

The following Mercy programs are available for physicians to refer their patients to and to help in managing heart disease.

Heart Smart and CHAMP® 916.564.2880

Cardiac Rehabilitation
Mercy General Hospital 916.453.4521
Mercy San Juan 916.537.5296

Pulmonary Rehabilitation / Smoking Cessation
Mercy General Hospital 916.453.4268
Mercy San Juan 916.537.5299

Cardiac Support Group 916.733.6966
(formerly ICD Support)

Heart & Vascular HealthScreen 916.733.6245

HeartCaring 916.733.6245



The 22nd Annual Cardiology & Electrophysiology Symposium, hosted by Mercy Heart & Vascular Institute, took place Oct. 6 and was a success.

Pictured above are: Symposium Co-Chairman Scott Baron, MD; Michael Chang, MD; Symposium Co-Chairman Gearoid O’Neill, MD; Steven Fowler, MD; and Sanjay Kaul, MD.

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