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INSIDE

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Medicare coverage opens up EECP's noninvasive option for the elderly

Atraumatic procedure bypasses the bypass for patients with no other hope

The Health Care Financing Administration (HCFA) in Baltimore has extended Medicare coverage as of July 1 to enhanced external counterpulsation (EECP), the noninvasive, atraumatic outpatient treatment for patients with coronary artery disease (CAD). Coverage includes patients with disabling angina who, in the opinion of a cardiologist or cardiothoracic surgeon, are not readily amenable to surgical interventions such as angioplasty or bypass. Often candidates have undergone multiple invasive procedures that either failed or no longer suffice, and additional interventions may be too risky or refused by the patient. The procedure can also be used before a bypass or angioplasty when they are not unequivocally indicated.

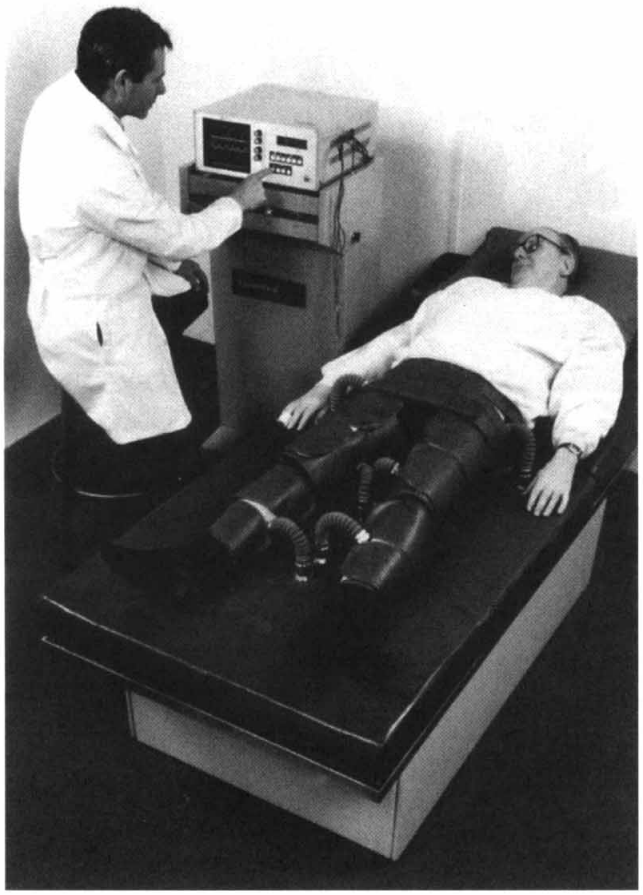
The Medicare reimbursement for EECP has not been established, but experts estimate it will be $7,000 per full treatment course — one-third typical charges associated with angioplasty ($23,200) and one-sixth those for bypass surgery ($35,700). Because EECP carries almost no risks or complications, costs over time are also kept down.

Donald Caton, director of managed care at Healthcorp of America in Atlanta, says he and colleagues are working with HCFA on developing a new code for EECP. At first, HCFA instructed carriers to use CPT code 97016 in addition to modifier "GO" or "GP" until a specific code for EECP could be developed. "But the ACC [American College of Cardiology in Bethesda, MD] would not accept 97016," he says. "So HCFA backtracked and reissued a directive to use 93799 — 'cardiac procedure by report.'

KEY POINTS

- Medicare now covers external counterpulsation — a compression therapy system for patients with coronary artery disease.
- Candidates are patients who have undergone failed invasive procedures — or additional interventions may be too risky or refused.
- EECP typically costs one-third of charges for angioplasty and one-sixth those for a bypass.

EECP Setup



Source: Vasomedical Inc., Westbury, NY.

Providers of EECP must submit clinical notes explaining the procedure, patient indications, and what was wrapped into EECP — plethysmography, three-lead EKG, oxygen saturation." Paperwork is now more complicated than it used to be.

Before Medicare covered EECP, most patients at Healthcorp were covered by Medicare secondary plans that pay if Medicare doesn't. "Now, their supplement plans will usually pick up what Medicare doesn't pay," says Caton. "Some patients who cannot self-pay and are without insurance apply for financial assistance through this company. We use the same criteria as other institutions — below poverty level, they pay nothing then we provide from $4,700 on up to the full billable charges of $11,439."

Medicare assigns every procedure a number of points. That number is multiplied by a dollar amount that changes every year, depending upon the federal budget. "This year that dollar amount is $35," says Caton. "If the procedure is worth seven points, the Medicare allowable amount would be $245 per session." That would come out to $8,575 for the course. Medicare reimburses 80% of that, or about $7,000. "We charge $11,439," he says, "but will be reimbursed about $7,000. We can't bill Medicare different from any other carrier."

But that point structure for EECP has not yet been established, and HCFA has delegated that decision to providers in the field. "We're all in the process of talking with the HCFA claims administration office in each jurisdiction to understand what the cost inputs are," says Caton. "Then, they will be broken down into the point system, and we'll know what the allowable charge is."

Picking the right patients

Karen Manzo, RN, clinical director of HeartCare Centers of Ohio (part of Grant Riverside Methodist Hospital in Columbus) says, "Patients eligible for EECP must be in Canadian Cardiovascular Classification [CCC] 3 or 4." HeartCare uses the New York Heart Association (NYHA) classification for congestive heart failure (CHF) patients and the CCC classification for CAD. "They also must have a clinical condition that warrants them unsuitable to have bypass surgery or other surgical intervention."

When Manzo submits for reimbursement, she lists the disqualifier that makes a patient inoperable or puts him at high risk for operative complications. "Sometimes a patient's coronary anatomy may not be amenable to an operative procedure," she says, "or he may have a comorbidity that creates risk, such as cancer or a pulmonary problem."

HeartCare does about 20 EECP procedures a day. "Until Medicare covered this, patients usually self-paid," says Manzo. "It is typically a seven-week course, 35 hours in all; but occasionally, if the patient comes from a distance, two one-hour sessions are given in a day. There's no data on the benefit of twice-a-day vs. once-a-day therapy."

Three centers involved in CHF study

HeartCare, along with two other centers in the United States — the University of Pittsburgh and the University of California at San Francisco — is currently involved in a clinical study of EECP for CHF patients. "We are looking at 40 patients with

CHF and the safety of their undergoing EECP," says Manzo. There is no data yet.

EECP is thought to promote a natural bypass around blocked heart vessels and has been shown to be most effective in patients who have single- or double-vessel disease. **(See www.eecp.com on the Internet for extensive information on EECP. Also, see *Cost Management in Cardiac Care,* July 1997, p. 87, for earlier coverage of the subject including contraindications and precautions.)**

The procedure uses hemodynamic principles to relieve angina by increasing coronary blood flow to ischemic areas of the myocardium. It involves a series of compressive air cuffs placed on the patient's legs and buttocks. Timed by the patient's EKG signal, a microprocessor controls inflation and deflation of the cuffs at specific points during the cardiac cycle. During diastole, the cuffs sequentially compress vascular beds, creating a retrograde pressure wave and increasing perfusion pressure, blood flow, and oxygen supply. During systole, the cuffs are deflated simultaneously to produce unloading, decreasing oxygen demand. Patients often begin to experience alleviation of angina after 15 to 20 hours of the recommended 35-hour regimen. The beneficial effects are sustained between treatments, and may persist long after completion of a course of therapy. **(See photo, p. 98.)**

Cardiomedics in Irvine, CA, manufactures a product that creates external sequential counterpulsation, but HCFA restricts its Medicare coverage "to those enhanced external counterpulsation systems that have sufficiently demonstrated their medical effectiveness in treating patients with severe angina in well-designed clinical trials," and the EECP system produced by Westbury, NY-based Vasomedical is the only such system to have undergone such testing. "Any other company's equipment is not included in the coverage even if it has a 510 clearance by the FDA," says Manzo. "It does not satisfy HCFA's requirement."

Researchers recently conducted a study on 139 CAD outpatients with angina and positive exercise treadmill tests in seven university hospitals to assess the safety and efficacy of EECP.[1]

Patients were given 35 hours of active or inactive counterpulsation over a four- to seven-week period. Exercise duration increased in both groups, and time to 1-mm ST-segment depression increased significantly in active counterpulsation as compared with inactive counterpulsation. Active-counterpulsation patients had fewer angina episodes as compared with inactive-counterpulsation patients. Nitroglycerin usage decreased in active counterpulsation but did not change in the inactive-counterpulsation group. The investigators concluded that the procedure reduces angina and extends time to exercise-induced ischemia in patients with symptomatic CAD. Treatment was relatively well-tolerated and free of limiting side effects in most patients.

Reference

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New device saves more than $3.5K per patient

Tiny nozzle shoots saline, pulverizes thrombi

The Food and Drug Administration (FDA) gave a quick nod in March to a new clot-busting device that uses tiny jets of saline to break up and suction away blockages in coronary arteries. Especially beneficial for patients who can't take blood thinners due to bleeding disorders, the AngioJet Rheolytic Thrombectomy System (Possis Medical, Minneapolis) serves as an alternative to thrombolytic therapy as well as adjunctive therapy pre- or post-angioplasty. The system has already won FDA approval for the removal of clots in patients undergoing kidney dialysis.

The system has three components: a reuseable drive unit that costs about $35,000, a disposable single-use pump set, and catheter that costs $1,450. **(See photo of the system, p. 100.)** Rheolytic thrombectomy is a one-day procedure as opposed to the all-day and overnight hospital stay needed for thrombolytic therapy.

Avoiding open-heart surgery

The minimally invasive device is best suited for the patient who has had multiple heart attacks and still has one or more large arterial blood clots. Since clot formation, the patient may have experienced angina after only minor physical exertion, with an adverse effect on his quality of life. For that patient, rheolytic thrombectomy with balloon angioplasty or stent placement could avoid open-heart surgery.

"Rheolytic thrombectomy is a good treatment

KEY POINTS

- A new clot-busting device uses tiny jets of saline to break up and suction away blockages in coronary arteries.
- The procedure lasts about a minute, and the vacuuming by itself takes about 40 seconds.
- The reuseable drive costs $35,000. Disposable single-use pump set and catheter together cost $1,450.
- Caveat: A bradycardiac is response-associated with rheolytic thrombectomy, and backup transvenous pacing should be available.

for the acute infarction patient — one who's had a bypass in the past but still has a large chunk of blood clot in a vessel," says **Gina Marone**, RN, BSN, clinical study coordinator at Allegheny University Hospital-Hahnemann Division in Philadelphia.

The pump-driven system is fed through the femoral artery directly to the area of the blood clot. A tip at the end of a catheter sucks in clots where they are pulverized by the force of the liquid, then drawn back up the tube and into a receptacle.

The snake-like 140-cm catheter has a double lumen design. One lumen contains a stainless steel high-pressure tube that delivers saline to the tip; the other larger exhaust lumen is for the removal of thrombus debris. The first tube is formed into a loop at the distal catheter tip. The underside of the loop has jet holes that are directed backward into the exhaust lumen. The high velocity jets create a localized low-pressure zone that draws the thrombus into the tip. The jets break up the thrombus and provide the driving force to push debris down the exhaust lumen into a collection bag.

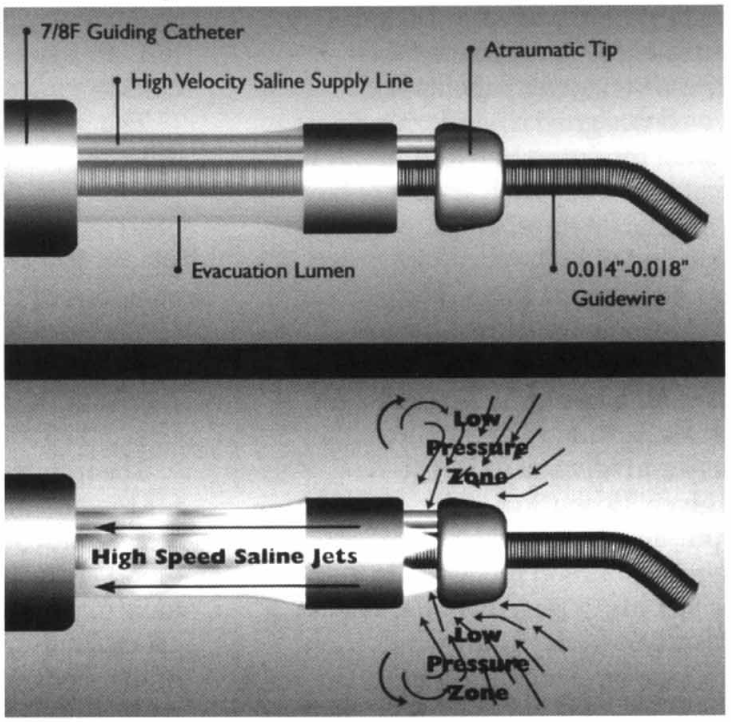
Treatment takes about a minute

Treatment takes about one minute, and once the blood clot is removed, interventional cardiologists can proceed with balloon angioplasty in the same setting. The system requires mild IV sedation rather than the general anesthesia that would be required with bypass surgery.

"The procedure lasts about a minute, and the vacuuming by itself takes about 40 seconds," says Marone. "We numb the groin, then when we activate the device we give a relaxing drug cocktail and tell patients they'll get some chest pain and not to worry." All patients undergoing such treatments are premedicated.

The AngioJet Rheolytic Thrombectomy System

The AngioJet uses tiny jets of saline to break up clots that are then suctioned away.



Source: Possis Medical, Minneapolis.

Initial Hospital Costs

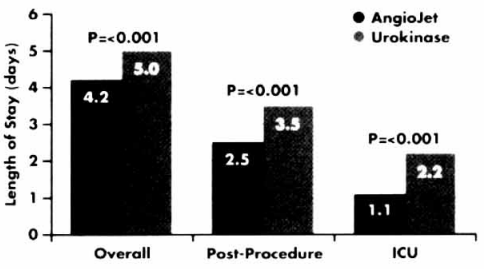
INITIAL HOSPITAL COSTS

	AngioJet	Urokinase	P-Value
Index Procedures	$ 8,080	$ 9,021	0.006
Unplanned Procedures	$ 392	$ 847	<0.001
Hospital Room/Ancillary	$ 6,732	$ 8,637	<0.001
Total*	$15,204	$18,759	<0.001

*Excluding MD fees

Length of Stay

LENGTH OF STAY



Source for both charts: VeGAS 2 Investigators Cardiovascular Data Analysis Center, Boston.

Before AngioJet was approved by the FDA, **Daniel McCormick**, DO, principal research study investigator at Hahnemann, and Marone used the system in research studies at Allegheny. In Marone's opinion, rheolytic thrombectomy saves money in certain circumstances: "The choice is case-specific. There are antiplatelets on the market such as abciximab (Eli Lilly's ReoPro) that decrease platelet stickiness so clots don't adhere; but for large chunks of clots, especially in a bypass graft, this device works well. Antiplatelets work well with straight primary angioplasty and stenting." And not all patients can take antiplatelets.

A recent economic study that was presented at this year's annual American College of Cardiology conference compared the rheolytic system to therapy with urokinase (Abbott Park, IL-based Abbott Laboratories's Abbokinase) and reported that rheolytic thrombectomy saved more than $3,500 per patient in reduced hospital stays, doctors' fees, and other costs.[1]

Investigators looked at inhospital and one-year follow-up costs for 349 patients with thrombus-containing lesions. Participants were randomized to treatment with either of the two modalities, and investigators found the use of the AngioJet system saved $3,555 when compared with the cost of prolonged urokinase during the initial hospitalization. **(See chart, above left, showing initial hospital costs.)** Three major savings factors were:

- shortened length of stay — 4.2 days vs. 5 days **(see bar graph, above right)**;
- reduction in periprocedural infarction and bleeding complications — $3,519 and $5,997, respectively;
- need for a single catheterization for most rheolytic patients — $2,460.

Compared to standard treatment with urokinase, the study authors concluded, rheolytic thrombectomy both improved clinical outcomes and reduced overall costs.

But is rheolytic thrombectomy as effective and safe as the traditional drug for treating these patients? The same group of researchers ran a trial testing that, and concluded that, yes, the two techniques are equally effective, and that the mechanical technique is significantly safer.[2]

AngioJet patients had a significantly higher procedure success rate and a lower complication rate than the urokinase patients. Freedom from major adverse cardiac events persisted for up to one year in the rheolytic thrombectomy group. **(See bar chart, p. 102, showing major adverse events to 30 days.)**

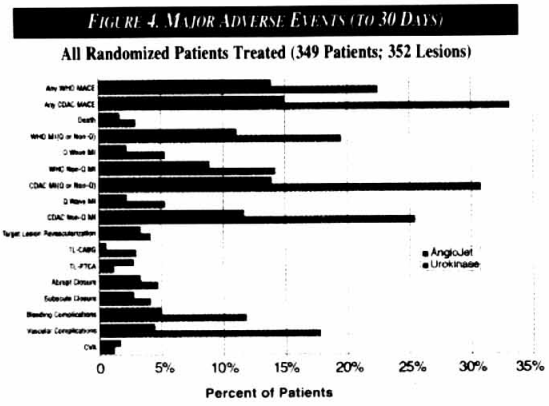
New catheters still being tested

"Possis has FDA market approval for this vacuum device," says Marone, "but we're still running trials on other new catheters that the company is developing." Marone told *Cost Management in Cardiac Care* that there is no other product available that accomplished the same task as AngioJet.

"The only product that somewhat compares is a balloon occlusion device that's not yet FDA approved," says Marone.

The Guardwire balloon occlusion system is still under investigation by cardiologists at Rush-Presbyterian-St. Luke's Medical Center in Chicago. With that system, a small, flexible wire with an inflatable balloon at the tip is advanced through the catheter, past the blockage to the site where the bypass vein meets the coronary artery. It works by sealing one end of the bypass graft

Major Adverse Events (to 30 Days)



Source: VeGAS 2 Investigators Cardiovascular Data Analysis Center, Boston.

with a balloon to prevent the debris produced during an angioplasty from floating downstream into the coronary artery.

A second balloon is inflated at the site of the blockage, pressing the material that caused the blockage against the vessel wall within the bypass graft to restore blood flow to the heart. A low-pressure vacuum aspiration catheter is threaded along the guide wire to draw out remaining debris from inside the vessel.

Avoiding angioplasty in old grafts

The Guardwire system seems best suited for patients with previous bypass grafts.

"Physicians have avoided the use of angioplasty in patients with diseased, old, bypass grafts because of the serious complications that can arise when debris dislodges during angioplasty and then blocks a coronary artery downstream," said Jeffrey Snell, MD, associate director of interventional cardiology at Rush in a press release. "Unlike plaque that narrows or blocks a coronary artery, a combination of friable plaque and organized blood clots narrow a bypass graft. This material often breaks loose when an angioplasty balloon is inflated in the bypass vein graft."

Other devices that serve as alternatives to open-heart surgery and that increase the effectiveness of angioplasty procedures are the Guardian system manufactured by Radiance Medical Systems in Irvine, CA, and another manufactured by Percusurge in Sunnyvale, CA.

Marone says that what she and McCormick liked about the AngioJet was that "it's very site-specific. It evacuates clots very effectively. In all the cases we saw, there was definite improvement with total evacuation of the thrombus."

Put a pacemaker in place during saline pump therapy

Warning: A bradycardiac response is associated with rheolytic thrombectomy, and backup transvenous pacing should be available.

"Whenever we used the device, we put in a pacemaker prophylactically during the case," says **Gina Marone**, RN, BSN, clinical study coordinator on the AngioJet Rheolytic Thrombectomy System (Possis Medical, Minneapolis) at Allegheny University Hospitals Hahnemann in Philadelphia. "The pacemaker would kick in when the patient's heart rate went down — in case patients brady-downed." A couple of our study patients went into asystole, but recovered right after Marone and McCormick shut off the device. Marone says that when you do any type of similar intervention, you expect that response.

"We did notice it was associated with the AngioJet, however," she says.

(For more information on bradycardiac response, see paper published by Ochsnes Medical Institutions, New Orleans, "Bradyarrhythmias during rheolytic thrombectomy" at www.ochsner.org/cardiology/pdf/laacc/1996/rt.pdf.) ■

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Suggested reading

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Guest Columnist

How the 'best' hospitals get the best AMI outcomes

A low-tech solution: Aspirin and beta-blockers

By **Elgin K. Kennedy**, MD
Editor, *The Assertive Utilization and Quality Report*

Each year in July, *U.S. News & World Report* publishes a list of "America's Best Hospitals" modeled on Avedis Donabedian's three elements for measuring quality — structure, process, and outcome.[1]

University teaching hospitals routinely score highest, presumably because they have concentrations of clinical expertise, a focus on clinical research, and access to advanced technologies.

However, a recent study provides a low-tech explanation for better acute myocardial infarction (AMI) outcomes found at the "best" hospitals, one that can be implemented at any hospital: More careful adherence to national practice guidelines in the use of aspirin and beta-blocker therapy.[2]

The authors analyzed data on 150,000 Medicare AMI patients collected by the Cooperative Cardiovascular Project of the Health Care Financing Administration and found that the top-ranked hospitals had significantly lower risk-adjusted 30-day mortality rates than other hospitals, regardless of whether the other hospitals were similarly equipped. **(See chart, p. 104.)**

The authors conclude that much of the survival advantage was due to higher use of aspirin and beta-blockers rather than to greater use of high-tech thrombolytic therapy or primary angioplasty.

Aspirin should be immediately given at the time the AMI diagnosis is made, unless there is a specific contraindication such as allergy or recent gastrointestinal hemorrhage. In the second International Study of Infarct Survival, aspirin was found to be nearly as effective as streptokinase, reducing 30-day mortality 23% in 17,000 AMI patients. The benefit was additive in patients receiving both aspirin and streptokinase. Other studies have revealed similar benefit from immediate aspirin therapy.

Beta-blockers make a difference

Early administration of IV beta blockers in nearly 30,000 AMI patients enrolled in 28 randomized trials revealed an average 14% reduction in mortality during the first week of therapy. Reinfarction was reduced 18%. Beta-blocking agents reduce infarct size by reducing heart rate, blood pressure, and myocardial contractility, all of which diminish myocardial oxygen demand.

Only about 40% of AMI patients are ideal candidates for the immediate use of IV beta-blocker therapy because of relative contraindications including hypotension, bradycardia, asthma, and chronic obstructive pulmonary disease.

The benefits in short-term mortality by using aspirin and beta-blockers have been clearly shown in several randomized clinical trials. It is clear from *The New England Journal of Medicine* study that on average, even the top-ranked hospitals fail to reach the goal of 100% compliance. That goal is possible however, because the authors report some of the similarly equipped and non-similarly equipped hospitals did reach 100% compliance.

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How the 'Best' Hospitals Compare in Aspirin/Beta-blocker Use

Hospitals top-ranked by the *U.S. News & World Report's* list of "America's Best Hospitals" **(see article, p. 103)** had significantly lower risk-adjusted 30-day mortality rates than other hospitals, regardless of whether the other hospitals were similarly equipped:

30-day Mortality	
Top-ranked hospitals	15.6%
Similarly equipped hospitals	18.3%
Non-similarly equipped hospitals	18.6%

Much survival advantage was due to higher use of aspirin and beta-blockers, rather than use of high-tech procedures, such as thrombolytic therapy or primary angioplasty.

Use of aspirin (in ideal candidates)	
Top-ranked hospitals	96.2%
Similarly equipped hospitals	88.6%
Non-similarly equipped hospitals	83.4%

Use of beta-blocker (in ideal candidates)	
Top-ranked hospitals	75%
Similarly equipped hospitals	61.8%
Non-similarly equipped hospitals	58.7%

Source: Chen J, Radford MJ, Wang Y, et al. Do 'America's best hospitals' perform better for acute myocardial infarction? *New Engl J Med* 1999; 340:286-292.

[The preceding article was first published in the April 1999 issue of The Assertive Utilization and Quality Report *— $60 per year (12 issues). For more information, contact Elgin Kennedy, MD, 204 Second Ave., No. 334, San Mateo, CA 94401. Telephone: (415) 348-3647.]*

Editor's note: The author of this article suggests that a way to improve quality and cost-effectiveness at your hospital is to conduct an audit of your last 30 patients who were discharged with the diagnosis of AMI. Determine the percentage of patients who received aspirin within 30 minutes of admission to the ED, and determine the percentage of patients who received aspirin at any time during their stay there. You might also study the use of IV beta-blocker therapy in ideal candidates.

The ACC / AHA guideline for the management of patients with acute myocardial infarction, the AHCPR guideline for diagnosis and management of unstable angina, and the national guideline for coronary artery disease with myocardial infarction can all be found at The National Guideline Clearinghouse, a comprehensive database of evidence-based clinical practice guidelines and related documents produced by the Agency for Health Care Policy and Research in partnership with the American Medical Association and the American Association of Health Plans: www.guideline.gov. For example, the ACC / AHA guideline states for aspirin therapy:

• **Class I** *(Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective):* A dose of 160 to 325 mg should be given on Day 1 of acute MI and continued indefinitely on a daily basis thereafter.

• **Class IIb** (*Usefulness/efficacy is less well established by evidence/opinion):* Other antiplatelet agents such as dipyridamole or ticlopidine may be substituted if true aspirin allergy is present. ■

Proteins tell more about risk than cholesterol

Cholesterol carriers are better predictors

Researchers have identified three proteins whose blood levels are major indicators of repeat heart attack risk.[1] The cholesterol carriers may provide a better analysis for determining risk than the usual cholesterol level test because they are more sensitive detectors. Measurement of the proteins is a strong indicator even when compared to other risk factors such as smoking, high blood pressure, diabetes, and cholesterol level itself.

"This finding provides a foundation for better risk identification and a more rational approach to care of a patient and prescription of drugs that target the primary risk factor for heart attacks," wrote **Arthur J. Moss**, MD, professor of medicine and cardiology at the University of Rochester

KEY POINTS

- Three cholesterol-carrying proteins are major indicators of repeat heart attack risk.
- In a study, individuals with low apo A-1, high apo B, and high D-dimer blood levels were eight times more likely to experience a heart attack within two years than those with normal levels.
- Protein tests identify more individuals at risk and one day may replace cholesterol testing.

(NY) Medical Center and lead author of the study. Because the proteins are more sensitive risk detectors than cholesterol level, they may identify more individuals at risk and one day may replace cholesterol testing.

In the study, Moss and colleagues measured blood levels of apolipoprotein (apo) A-1, apo B, and D-dimer as well as 11 other blood factors in 1,045 patients who had experienced recurrent heart attacks. Apo A-1 is a cholesterol-removing scavenger, Apo B adds cholesterol to the blood, and D-dimer is associated with the creation of blood clots.

If low apo A-1, cholesterol accumulates

When apo B levels are high, the protein deposits cholesterol on the inside surface of the plaque. Then the cholesterol moves into the plaque, increasing the size of the fatty deposit. At normal levels, apo A-1 picks up the deposits before they enter the plaque, but if apo A-1 levels are low, cholesterol accumulates and forms more plaque, stressing the coating that usually keeps the plaque in place. If sufficiently weakened, the coating ruptures and forms a blood clot, triggering a heart attack and stroke.

In the study, 81 participants had a second heart attack; 25 died. Only the three proteins were associated with an increased risk of heart attack. Individuals with low apo A-1, high apo B, and high D-dimer blood levels were eight times more likely to experience a heart attack within two years than those with more normal levels, the study found. Patients with an abnormal blood level of only one of the proteins were twice as likely to have another heart attack within two years.

The study results support continued use of cholesterol-lowering diet, exercise, and drugs in at-risk patients, wrote Moss, because the therapy favorably alters the concentration of proteins and helps reduce risk of plaque rupture as well as reducing clotting tendency. Yet other experts claim that at least 20 million Americans at risk of heart attack are not prescribed statins — one in five patients receive the drugs which cost $75 to $100 per month.

James Froehlich, MD, of the University of Michigan in Ann Arbor reviewed surveys of 250,000 patient visits over a six-year period and reported his findings at a cardiology conference in New Orleans this past spring. He found that 14% of those diagnosed with cardiovascular disease got a prescription for a statin. In addition, only half of heart attack patients leave a hospital with a prescription.

Reference

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3-D MRA: A safer, less expensive diagnostic

'In essence, in about a half an hour, you're done'

A simple 30-minute test may soon replace more invasive X-ray angiography to diagnose coronary heart disease, researchers report.[1]

Safer, cheaper, and more convenient, 3-D coronary magnetic resonance angiography (MRA) provides images of the coronary arteries without injection of a dye or exposure to X-ray. The cost of MRA is less than one-quarter that of an X-ray angiogram and causes patients considerably less discomfort and risk than the more traditional approach.

KEY POINTS

- 3-D MRA costs less than one-quarter the expense of an X-ray angiogram.
- The technology provides images of the coronary arteries without injection of a dye or exposure to X-ray — ease of use and high quality.
- The traditional procedure carries with it risk of infection and bleeding, even heart attack and stroke.

Another advantage of the technique is that the new methodology also can be used to evaluate the anatomy, contractility, perfusion, and valvular function of the heart, providing a comprehensive, noninvasive, cardiac examination.

During conventional angiography, patients must lie still while a small tube is placed inside the blood vessels to deliver the dye. After vessels are X-rayed, the patient often must remain in the hospital for a recovery period of four to six hours.

Old method carries risk of infection

The traditional procedure carries with it risk of infection and bleeding, and in a small fraction of cases, heart attack and stroke, wrote Warren J. Manning, MD, co-director of the Cardiac MRA Center at Beth Israel Deaconess Medical Center in Boston, associate professor of medicine and radiology at Harvard Medical School, and senior author of the study.

> ***"In essence, in about a half an hour, you're done. It is likely that the technique will become the standard approach at many cardiac MRA centers because of its ease of use and high quality."***

"We have multiple methods to try to determine if our patients have coronary heart disease," he wrote. "However, we have no methods to image the coronary arteries themselves that do not require injecting a dye into a blood vessel."

Done in a half hour

With the new MRA technique, sets of images of the blood vessels on each side of the heart are acquired. Each set of images takes 10-15 minutes during which time patients simply need to lie still and breathe normally. Individuals found to have blockages can then be treated with angioplasty or surgery.

"So, in essence, in about a half an hour, you're done. It is likely that the technique will become the standard approach at many cardiac MRA centers because of its ease of use and high quality," says Manning.

The team first reported that MRA could be used for coronary artery imaging in 1993, Manning says, but the approach at that time required patients to hold their breath 30 to 40 times for about 16 to 20 seconds each time. Most patients could be trained to do that, but the images were not as clear as they could be. With the new MRA methods, patients no longer need to hold their breath, and image quality is improved.

In Manning's study, eight healthy adults and five patients with confirmed heart disease underwent the new technique. The investigators reported that MRA compared well with conventional X-ray angiograms and in fact that there was improved definition of the arteries.

NIH evaluates MRI for emergency MI, stroke

In a related story, the National Institutes of Health (NIH) announced in late June that it is launching a study of whether magnetic resonance imaging (MRI) should be used in emergency departments as a diagnostic tool to evaluate myocardial infarction (MI) and stroke. **(See *Cost Management in Cardiac Care,* April 1999, p. 44, for story about using MRI for infarction diagnosis.)**

This would be the first time that MRI would be part of a protocol to diagnose heart disease upon admission. It is hoped that the NIH study will show whether the technology can more quickly and accurately identify heart attacks and strokes so patients can benefit from earlier treatment. The four-year trial will be conducted at Suburban Hospital in Bethesda, MD, which will be equipped with two MRI scanners.

Patients with unquestionable MI on presentation will receive thrombolytic therapy, angioplasty, or other treatment and will undergo MRI after stabilization. Patients with an uncertain cause of chest pain on presentation will undergo immediate MRI. Patients with suspected stroke will undergo both computed tomography (CT) scans and MRI so that investigators can compare efficacy. If MRI proves to be as good or better than CT for seeing blood, MRI alone will replace both tests as a protocol for most stroke patients.

The new MRIs are more sensitive for detection of blood and can image cells that are ischemic but not yet infarcted. CT cannot do that. A whole MRI takes about 15 minutes, and the results are easier to interpret. CT takes about 10 minutes, but the results are more open to question.

Reference

1. Botnar RM, Stuber M, Danias PG, et al. Improved coronary artery definition with T2-weighted, free-breathing, three-dimensional coronary MRA. *Circulation* 1999; 99:3,139-3,148. ■

Aortic-valve sclerosis linked to AMI risk

Death rates grow with aortic-valve abnormality

Aortic-valve sclerosis is common in the elderly and was thought until recently to be relatively harmless. But the results of a study suggest that it is actually associated with an increased risk of death due to cardiovascular disease.[1] The condition is characterized by a thickening and stiffening of the valve leading from the heart to the aorta.

Investigators at the University of Washington in Seattle, Wake Forest University in Winston-Salem, NC, and the Mayo Clinic in Rochester, MN, assessed the EKGs of 5,600 subjects 65 or older.

At baseline, the aortic valve was normal in 70% of subjects, sclerotic but without outflow obstruction in 29%, and stenotic in 2%. After five years, the researchers found a stepwise increase in deaths from cardiovascular causes as well as deaths from other causes with increasing aortic-valve abnormality. Cardiovascular-related deaths were 6% in the group with normal valves, 10% in the groups with sclerotic valves, and nearly 20% in the groups with stenotic valves. Overall mortality was 15% in the normal valve group, 22% in the sclerotic group, and 41% in the stenotic group.

Their conclusion was that aortic sclerosis "is associated with an increase of approximately 50% in the risk of death from cardiovascular causes and the risk of myocardial infarction."

In an editorial accompanying the study, Blase A. Carabello, MD, of the Houston VA Medical Center commented that assessment of aortic sclerosis requires only a stethoscope, as the condition generally causes a slight murmur, and is an easy way to assess risk. But he cautioned that we cannot draw any conclusions about the link between aortic valve disease and risk of mortality. About a quarter of adults over 65 have aortic sclerosis that does not interfere with blood flow.

Reference

1. Otto CM, Lind BK, Kitzman DW, et al. Association of aortic-valve sclerosis with cardiovascular mortality and morbidity in the elderly. *N Engl J Med* 1999; 341:142-147. ■

Y2K update

Does your computer know 2000 is a leap year?

Test your PC for leap-year savvy

The last millennium leap year was 1600, so it's safe to say many systems do not recognize 2000 as a leap year. It's recommended that you test your computer ahead of time. As always, back up all data before testing:

- Set the date to Feb. 28, 2000, and the time to 23:55 — 11:55 p.m. — then shut down in the normal manner and turn off the power.
- Wait at least five minutes, then turn on the computer.
- Verify that the date is Tuesday, Feb. 29, 2000, and the time is a few minutes past midnight.
- If the day, date, or time is incorrect, then you have a problem with your basic input/output system (BIOS). Correcting the problem may require a software upgrade to the BIOS or a BIOS chip replacement. Contact the manufacturer of your computer to obtain the upgrade.
- Repeat the same test without shutting down the machine and turning off the power.

You can determine the compliance of your PC's BIOS by following these steps:

- Set the date to Dec. 31, 1999, and the time to 23:55 — 11:55 p.m. – then shut down the computer in the normal manner and turn off the power.
- Wait at least five minutes, then turn on the computer.
- Verify that the date is Saturday, Jan. 1, 2000, and the time is a few minutes past midnight.
- If incorrect, you have a problem with your BIOS. Contact the manufacturer of your computer to obtain the upgrade.
- Repeat the same test without shutting down the machine and turning off the power.

Note: if you have software applications that take automatic action based on the date of your computer, make sure those applications are disabled before conducting these tests. Damage or loss of data may result otherwise. ■

Source: Y2K Alert for Cardiology Practices, 1999.

NEWS BRIEF

Advisory on Trilogy pacemakers

St. Jude Medical in St. Paul, MN, issued an advisory late July that the batteries in a small number of its Trilogy pacemakers could drain prematurely. There have been no injuries associated with the defect, but the problem has occurred in approximately 88 pacemakers. The medical devices manufacturer issued a technical memo detailing a follow-up procedure to identify whether a pacemaker might experience premature battery depletion. That memo can be accessed at **www.sjm.com/stjude/common/htm/frm_clin.htm** on the Internet. The problem can be identified by an early rise in battery impedance, therefore the company advises a special follow-up and monitoring program for patients with devices implanted within the last 12 months (Models 2250, 2260, 2264, 2308, 2318, 2350, 2360 and 2364). Battery impedance, not battery voltage, provides an early and reliable indication of probable premature battery depletion. ■

SourceKit

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