

### Heart Overhaul

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#### Sleep and Cardiovascular Death

Two studies draw attention to the newly recognized association between sleep disorders and heart trouble.<sup>1</sup> The first study was on the use of continuous positive airway pressure (CPAP) for patients with central sleep apnea and heart failure<sup>2</sup> and the other study was on obstructive sleep apnea as a risk factor for stroke and death.<sup>3</sup> They had noted that central sleep apnea is characterized by intermittent loss of respiratory drive, while obstructive sleep apnea results in a narrowing or collapse of the airway. While they differ, both sleep apneas are linked to the modern-day epidemics of obesity, cardiovascular disease, and heart failure.

The results of the first study, also referred to as the Canadian Positive Airway Pressure trial (CANPAP), were disappointing because, even though the treatment was carefully applied, it was not sufficiently effective. Patients with both heart failure and central sleep apnea received either CPAP, a mask worn during sleep that delivers air through the airway, or no treatment to see if CPAP improved survival. In the end, mortality was similar in both groups. In fact, early divergence of survival curves favoring the control group contributed to premature termination of the study.

The second study provides strong support that obstructive sleep apnea is likely involved in causing strokes, transient ischemic attack or sudden death. The limitation of this study is that most people in it were already receiving treatment for obstructive sleep apnea. They postulate that several factors, including decreased cerebral blood flow and hypercoagulability, may provide the mechanistic links between obstructive sleep apnea and stroke. These studies provide interesting insights into the links between sleep and heart disease.

1. Somers VK Sleep - A New Cardiovascular Frontier. *N Engl J Med*; 2005; 353:2070-73.
2. Bradley TD, Logan AG, Kimoff RJ, Sériès F, Morrison D, Ferguson K, Belenkie I, et al. The CANPAP Investigators. Continuous Positive Airway Pressure for Central Sleep Apnea and Heart Failure. *N Engl J Med* 2005; 353:2025-33.
3. Yaggi HK, Concato J, Kernan WN, Lichtman JH, Brass LM, Mohsenin V. Obstructive Sleep Apnea as a Risk Factor for Stroke and Death. *N Engl J Med* 2005; 353:2034-41.

#### Ideal Physician Behavior

A study of patients has found seven behaviors define the 'ideal' physician and supports an Institute of Medicine recommendation that quality medical care should include a patient-centered approach.<sup>1</sup> The study was designed to develop a comprehensive set of ideal physician behaviors. Telephone interviews were conducted in 2001 and 2002 with 192 patients. The article was based on transcripts of patients detailing their best and worst experiences with a physician. From the transcripts, study authors identified seven behaviors that describe the ideal physician: confident, empathetic, humane, personal, forthright, respectful and thorough.

Conversely, patients who described a "worst physician" experience focused on traits reflecting opposites of desired physician behaviors especially perceived insensitive or disrespectful behavior. The study suggests that training new and practicing physicians about interpersonal skills could have far-reaching impact on patients. The quality of a patient's relationship with a physician can affect not only a patient's emotional responses, but also behavioral and medical outcomes such as compliance and recovery.

The health institutions ought to follow the recommendations of the Institute of Medicine to improve quality by fostering a patient-centered approach to medicine.<sup>2</sup> They also say that health care cannot meet the standards of quality if the patient-physician interaction is hurried, disrespectful, cold or callous. They noted the seven behavioral traits identified by researchers as ideal for physicians can be taught in various settings, such as having medical residents witness positive interactions which they can model.

Of the seven behavior traits, "thorough" was named most often by patients. Patients can sense if a physician is rushed or preoccupied, the study's authors say, just as they can sense a physician's genuine interest. In their interviews about physician behavior, patients rarely commented on a physician's technical skill. This does not suggest technical skill is less important than interpersonal skill, the authors say, but rather more difficult for patients to judge.

1. Bendapudi NM, Berry LL, Frey KA, Parish JT, Rayburn WL. Patients' Perspectives on Ideal Physician Behaviors. *Mayo Clin Proc* 2006;81:338-44
2. Li JTC. The Quality of caring. *Mayo Clin Proc* 2006;81:294-96

## Noninvasive Test to predict Coronary artery disease

A research team used a simple, noninvasive arterial tonometer to discover an association between stiffness in arteries and the presence and amount of coronary artery calcium, leading to the possibility of more accurate assessment of heart disease risk in adults with no symptoms. The test, aortic pulse wave velocity (aPWV), measures how fast the pulse wave travels down the aorta, the major artery arising from the heart. It is a potential screening tool because it is quick (takes 10-15 minutes), painless, noninvasive and likely to be less expensive compared with other cardiac screening tests. For the test, the patient lies on a bed and a pencil-like tonometer is placed on the skin over the carotid artery and then the femoral artery. The tonometer measures the pressure wave inside the artery, and the information is fed into a computer for calculation of aPWV. A slower pulse wave means the artery is more elastic and healthier; a faster wave means the artery is stiffer and less healthy.<sup>1</sup>

The research found that study participants with stiffer arteries also had a greater presence and amount of calcium in the coronary arteries, an indicator of coronary atherosclerosis. Previous research showed aPWV predicts cardiovascular disease in older adults, but the association of aPWV and the amount of coronary artery calcium (CAC) in the general population has been unknown. The association between artery stiffness and CAC strengthens the case for using aPWV as a screening tool, such as in adults with moderate risk, those with a family history of heart disease, patients with high blood pressure, and those with kidney disease.

Researchers tested 401 participants (213 men and 188 women; ages of 32 and 84) between 2002 and 2004, without a history of heart attack or stroke, for the community-based research project. The median age was 60. This research also discovered a significant interaction between aPWV and smoking history; the association between aPWV and the presence and quantity of CAC was stronger in smokers than in nonsmokers.

1. Kullo I, Bielak LF, Turner T, Shetty FP, II, Peyser PA. Aortic Pulse Wave velocity is associated with the presence and quantity of coronary artery calcium: a community based study. *Hypertension* 2006; 47: 174-79.

### Long QT syndrome clinical tests

A clinical test developed unmasks a potentially lethal syndrome known as long QT syndrome (LQTS), particularly concealed type 1 LQTS (LQT1).<sup>1</sup> Long QT syndrome is an uncommon, and sometimes fatal, heart rhythm disorder that is often present from birth. It affects one in every 3,000 people in the United States. If untreated, half the people with symptomatic LQTS die within 10 years

after symptom onset. People at risk of LQTS include children and young adults with unexplained fainting, near drowning, seizures or a history of cardiac arrest.

A) The study describes specific type of cardiac stress test in which a patient is given epinephrine revealing the concealed type 1 long QT syndrome with a high degree of accuracy. The epinephrine QT stress test can expose LQT1 at a 75 percent positive prediction rate weeks before confirmation through a blood test for LQTS genetic testing. In addition, the epinephrine QT stress test can provide subsequent physiological confirmation of a LQT1 genetic test result. While LQTS in some people can be diagnosed by the prolonged QT interval on an ECG, nearly 50 percent of LQTS, particularly type 1 LQTS, the most common subtype, may go unnoticed because the patient's resting ECG is normal.

From 1999 to 2002, 147 individuals, ages 8-59, had an epinephrine QT stress test conducted as part of a referral to Long QT Syndrome Clinic.<sup>1</sup> Results showed patients with LQT1 had prolongation of the QT interval during infusion of epinephrine. QT interval of more than 30 milliseconds during infusion had a positive predictive value of 76 percent for LQT1 even if the resting ECG was normal. Furthermore, nearly every patient (96 percent) with established LQT1 displayed QT interval prolongation.

B) Another recent study<sup>2</sup> examined the use of genetic testing for LQTS based on an initial clinical diagnosis and subsequent referral by physicians. Between 1997 and 2004, 541 consecutive unrelated patients were referred to Sudden Death Genomics Laboratory for LQTS genetic testing. Overall, LQTS-causing genetic mutations were discovered in more than half (272 out of 541) of the patients. In comparing patients who were diagnosed with LQTS and those who were not, important clinical differences were recognized. Now, with the maturation of LQTS genetic testing from the research arena to a clinical diagnostic test, physicians need to know and understand the performance characteristics of genetic testing. For example, the study revealed that when the patient's clinical profile fit the LQTS label fully, the detection rate of the genetic test was approximately 75 percent. In addition, the investigators noted that percentage of mutation-positive genetic tests varied tremendously among the physicians utilizing the research genetic test, ranging from 0 percent to 80 percent, suggesting the need for further education. Treatment for LQTS patients varies depending on each case, but options include medication or the placement of an implantable cardioverter defibrillator.

1. Vyas H, Hejlik J, Ackerman MJ. Epinephrine QT Stress Testing in the Evaluation of Congenital Long-QT Syndrome: Diagnostic Accuracy of the Paradoxical QT Response. *Circulation* 2006; 113: 1385-92.  
2. David J. Tester BS, Melissa L. Will BS, Carla M. Haglund, Michael J. Ackerman, Effect of Clinical Phenotype on Yield of Long QT Syndrome