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Vital Signs

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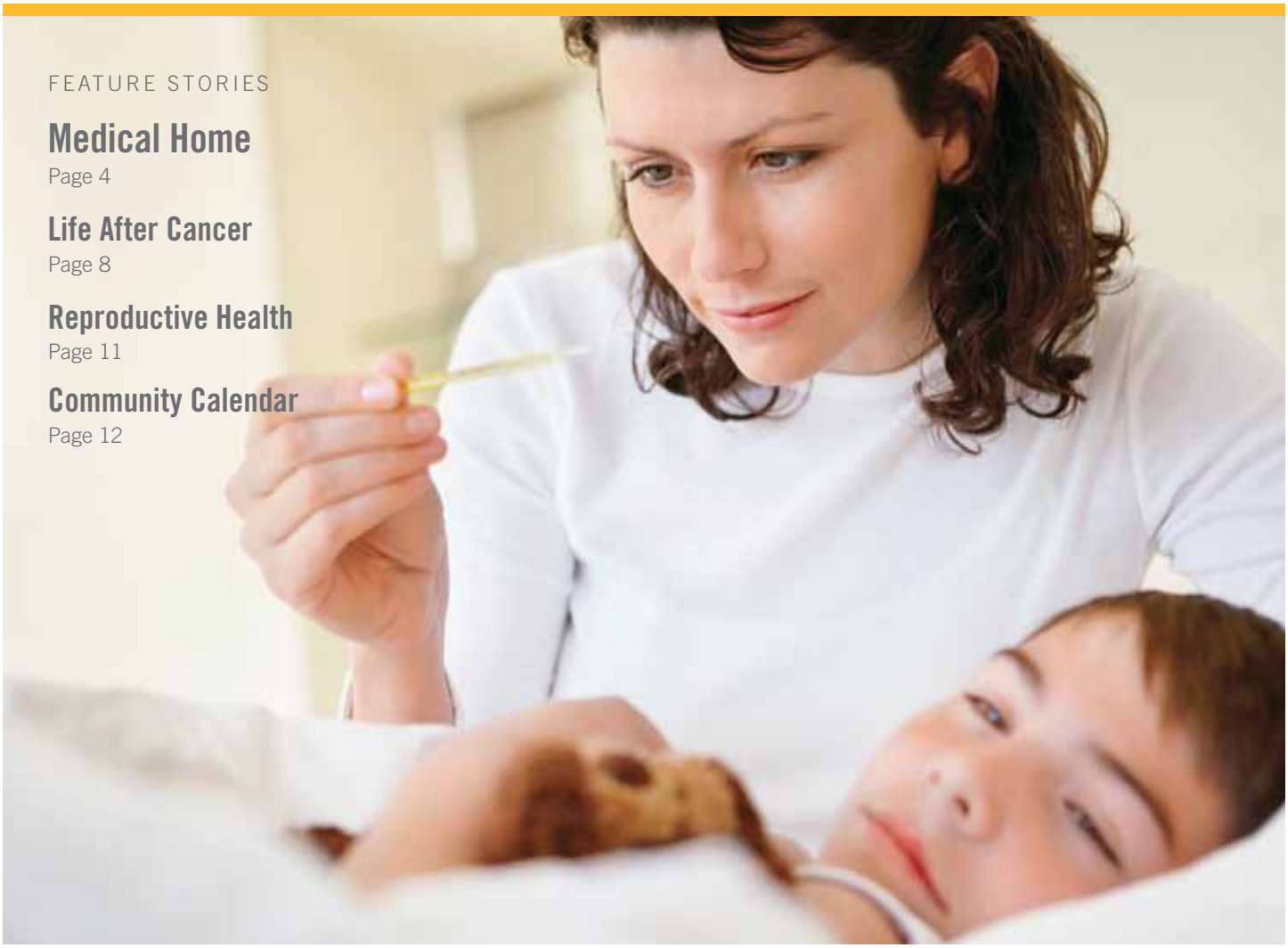
FEATURE STORIES



MRI Helps Diagnose and Treat Common Heart Defect

Hypertrophic cardiomyopathy is an inherited heart defect that is a common cause of sudden cardiac death in young people. The condition, which affects an estimated one in 500 people, causes the muscle mass of the left ventricle to thicken abnormally, forcing the heart to work harder to pump blood. Some patients are diagnosed after developing persistent symptoms, which include shortness of breath, dizziness, fainting and chest pain. Other patients may experience no symptoms and live a normal life with no heart-related problems, or they may unsuspectingly develop fibrosis (scar tissue) that eventually causes life-threatening cardiac

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of dental problems that could easily be addressed if treated at an early stage," Dr. Koretz says.

"There is a growing appreciation within the medical and dental professions of the concept of systems biology, which says that all parts of our body are connected," Dr. Wong notes. This appreciation has helped to fuel an emerging field of study: salivary diagnostics. UCLA has been at the forefront of research to find early biological clues of disease in saliva, which could greatly assist in efforts to prevent diseases or intervene at a stage when treatment is more likely to succeed. Within a few years, a visit to the dentist could include a saliva test to monitor for oral as well as systemic diseases before symptoms begin to develop, says Dr. Wong, who is part of a research team that discovered salivary markers for developing pancreatic cancer.

The connection between oral health and overall health underscores the importance of thorough brushing and flossing of teeth as well as making regular visits to the dentist, Dr. Wong says. But beyond that, since adults tend to visit a dentist's office more frequently than a physician's office, there is a movement to expand the role of the dentist to include routine blood pressure measurements to detect cardiovascular abnormalities, as well as glucose monitoring for individuals at risk for diabetes.

"One-fourth of people with diabetes are not diagnosed, and there are more than 20 million people who are pre-diabetic," Dr. Wong notes. "Dentists can be a major contributor as a partner with the medical community in conducting screenings and evaluations for diabetes and a number of other life-threatening diseases."

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MRI Aids in Diagnosis, Treatment of Patients with Common Heart Defect

arrhythmias (abnormal heart rhythms) or even sudden cardiac death. But by using magnetic resonance imaging (MRI), physicians are now able to get a better look at scar tissue in the heart muscle, making it easier to decide when and how to intervene in affected patients. Patients with hypertrophic cardiomyopathy who are at risk for arrhythmias may need intervention that can include placement of an implantable cardioverter-defibrillator (ICD), which uses electrical pulses or shocks to help control arrhythmias.

By using MRI, physicians may be able to elect in some cases "to take a more conservative approach to placing ICDs," says UCLA cardiologist Tamara Horwich, M.D., a specialist in cardiomyopathy and heart failure.

"Placing an ICD is a big decision for an individual patient," Dr. Horwich explains. "If MRI shows no evidence of scarring, we suspect the future risk of sudden cardiac arrest is lower than when scarring is present," she says. "On the other hand, if MRI shows extensive cardiac scarring, an ICD may be considered even in patients without traditional risk factors for arrhythmias or sudden cardiac death."

"MRI is the gold standard for detecting and quantifying scar tissue in the heart," says UCLA radiologist Paul Finn, M.D. "Using MRI, we can determine whether or not there is a scar, where it is, how extensive it is and even make an educated guess about what caused it." MRI, which uses magnetic fields and radio waves to create three-dimensional images and two-dimensional cross sections of the heart, provides additional prognostic information compared to echocardiography — the first step in diagnosing hypertrophic cardiomyopathy — by illustrating structures within the heart in addition to evaluating heart size and function, Dr. Finn says.

Cardiac ablation, which uses radiofrequency energy to destroy abnormal tissue blocking the electrical signal that regulates the heart beat, can be used in hypertrophic cardiomyopathy to treat arrhythmias.

MRI provides another advantage over echocardiography, according to UCLA cardiac electrophysiologist Noel Boyle, M.D. "MRIs allow us to target ablation sites more precisely," Dr. Boyle says. "We use sophisticated mapping systems during ablation procedures that incorporate the MRI images showing the entire cardiac structure. This allows us to focus on specific target areas and perform ablation procedures more quickly and accurately."

MRI also limits radiation exposure, according to radiologist Dieter Enzmann, M.D., chair of the UCLA Department of Radiological Sciences. "MRI doesn't use radiation," he says. "Currently, MRI images are performed earlier in the planning stages, but the ablation procedures are still performed using fluoroscopic guidance (X-ray technology, which uses a small amount of radiation). Our goal within the next five to 10 years is to transition to a complete MRI procedure, which will completely eliminate radiation."

Experts recommend that anyone who has a direct relative — parent, child or sibling — with hypertrophic cardiomyopathy be evaluated by a heart specialist.