

# THE SCAN

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Courtesy of: Center for Diagnostic Imaging

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The Center for Diagnostic Imaging

## In the News

• In a study of women ages 40 to 49 screened with mammography, the risk of finding invasive breast cancer was similar regardless of whether a woman had a family history of the disease, indicating that **this age group would benefit from annual screening.**

• With the help of an MRI biomarker, researchers have found that **people with smaller regions of the brain's cortex may be more likely to develop symptoms consistent with early Alzheimer's disease, even if they currently have no memory problems.** The study's findings could help detect people at high risk of preclinical Alzheimer's disease and future cognitive decline.

• CT versus MRI – the latter is the obvious choice for children because MRI does not use ionizing radiation, right? **Researchers say CT can be safer depending on the exam.** Changes in practice and CT technology require a re-examination of risk perceptions about MRI and CT angiography in children, according to Dr. S. Bruce Greenberg, professor of radiology and pediatric medicine at the University of Arkansas for Medical Sciences.

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## MRI shows promise as way to measure breast cancer prognosis

Quantitative MR measures such as diffusion-weighted imaging (DWI) and dynamic contrast-enhanced (DCE) imaging show potential for predicting breast cancer prognosis and treatment planning, according to research.

Dr. Sana Parsian, from the University of Washington, and colleagues conducted a study based on the hypothesis that DWI and DCE data would correlate with breast cancer histopathological markers and allow a tumor's cellularity and vascularity to be measured.

In DWI, the diffusion of fluids along a field gradient reduces the MRI signal, so researchers can determine the cellularity of a tumor by measuring the degree of water mobility. DCE enables the visualization of more information about tumor vascularity: A malignant cell group needs a blood supply to grow, and those kinetic vascular changes cause tumors to appear differently on DCE compared to normal tissue, according to Parsian.

MRI measures examined in the study included peak initial enhancement, percent rapid enhancement,

"I think the final goal of radiology is to get more information while doing the least amount of intervention possible for the patient," Dr. Parsian said in a statement released by the American Association for Cancer Research (AACR). "It would be great if we could improve our understanding of breast cancer biology and predict response to different therapies with imaging. Our study suggests MRI may play a valuable role in this process."

## MRI helps link silent strokes to memory loss

Research using MRI indicates that small areas of dead brain cells, or silent strokes, found in approximately one of four older adults are linked to memory loss later in life, according to a new study. The findings could provide additional information on memory loss symptoms and their causes, as well as help develop new methods of prevention.

The researchers analyzed 658 people ages 65 years and older who showed no signs of dementia. The subjects were scanned using 1.5-tesla MRI (Intera, Philips Healthcare), and they also underwent tests to measure their memory, language, speed at processing information, and visual perception.

Among the participants, 174 (26%) had silent strokes. Of those subjects, 132 were placed into a subcortical infarct group and 42 into a cortical infarct group, based on the location of the silent strokes. The remaining 484 individuals were in the "no infarct" group.

Upon review of MRI results, the researchers found that individuals with subcortical and cortical infarcts were more likely to have a clinical history of stroke, and participants with no infarct had larger relative hippocampal volumes -- the section of the brain associated with memory function -- than those with subcortical infarcts.

Mild cognitive impairment was found in 643 participants; a greater proportion of individuals with cortical infarcts met the mild cognitive impairment criteria, compared with those without infarct.

Hippocampal volume was associated with the long-term recall and delayed recognition aspects of the study's selective reminding test, and with delayed free recall. Subcortical infarcts correlated with performance on learning, long-term recall, and delayed free recall. Cortical infarcts were associated with performance on selective reminding test delayed recognition.

The study noted that individuals with infarct scored worse on memory tests than those with no signs of silent strokes, regardless of whether or not they had a small hippocampus.

## Cancer death rates continue 10-year decline in U.S.

Cancer incidence rates have held steady in the U.S., but cancer death rates declined slightly, according to a report recently released by the American Cancer Society (ACS). More than 1.6 million new cases of cancer are projected to occur in 2012, along with more than 575,000 deaths.

The ACS reported that between 2004 and 2008, the overall cancer incidence rate declined by 0.6% per year in men and was unchanged in women. Death rates for this period decreased by 1.8% per year in men and by 1.6% per year in women.

The reduction in overall cancer death rates since 1990 in men and since 1991 in women translates to more than 1 million total deaths avoided, according to the ACS Cancer Statistics 2012 report, published online January 4 in *CA: A Cancer Journal for Clinicians*.

Approximately 732,900 deaths were averted for men over an 11-year period. There was much less of a reduction in deaths for women, at approximately 291,500 over a 10-year period.



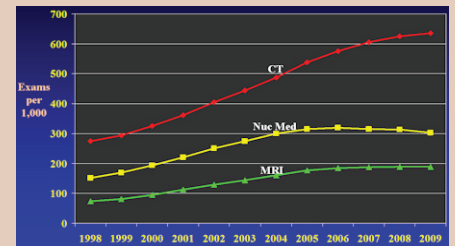
## Emergency departments drive growth in CT use

Emergency departments are major drivers of the recent explosion in CT utilization –without emergency department use, CT utilization rates would have stayed almost flat in recent years, according to researchers at Thomas Jefferson University Hospitals.

CT has been one of the fastest-growing medical imaging modalities in the past decade in the U.S., driven by the technology's ubiquity and cost advantage over more expensive modalities such as MRI. This rapid growth has generated widespread concern, however, due to fear that unnecessary CT utilization could be exposing patients to excess radiation dose while also increasing healthcare costs.

At the recent RSNA 2011 meeting, Dr. David C. Levin presented research he and his colleagues conducted to determine the role that emergency departments have played in the growth in CT utilization. Use of CT has continued to increase since 2006, even though the growth of modalities such as MRI and nuclear medicine has flattened.

Levin's team used information culled from Medicare Part B databases for 1998 through 2009, particularly checking place-of-service codes for four major care settings where imaging is performed: hospital inpatient settings, hospital outpatient facilities, private offices, and emergency departments.

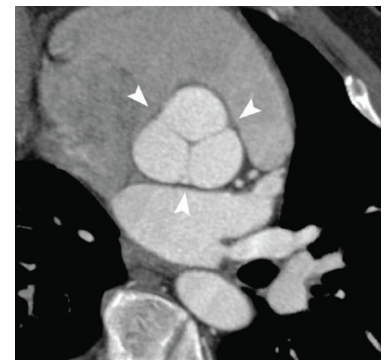


Medicare overall utilization rates of CT, MRI, and nuclear medicine (including PET), all locations.

## Imaging evolves to lead atherosclerosis care

The management of atherosclerosis, the No. 1 cause of death in the U.S., has been reinvented by advances in imaging technology, according to a panel presentation on Sunday at the RSNA 2011 meeting.

Led by Dr. Geoffrey Rubin, radiology chair at Duke University Medical Center, and Dr. Zahi Fayad, PhD, professor of radiology and cardiology at Mount Sinai Medical Center, the opening-day panel explored the evolution of CT angiography (CTA) as the leading imaging modality for atherosclerotic disease, as well as the growing contributions of other modalities in the refinement of atherosclerosis care.



Normal aortic root at coronary CTA illustrating the complex cornet shape above the basal ring.



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