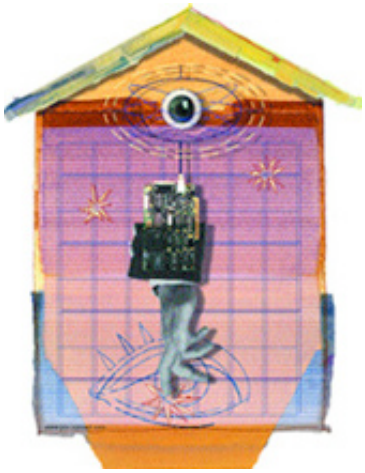
SPRING 2001
What's New



HEALTH NEWS

In Touch with Eyesight

USC and Caltech researchers pioneer a painless, cutting-edge computerized vision test.

A NEW FIVE-MINUTE vision test – using a simple desktop computer equipped with a touch-screen – promises to identify hard-to-detect eye diseases and even certain brain tumors.

Invented by USC neuro-ophthalmologist Alfredo A. Sadun and Caltech physicist Wolfgang Fink, the 3-D Computer-Based Threshold Amsler Grid Test is sensitive, specific and can discriminate between subtly different symptoms. "We can gain more information from this test than any other visual field test," says Sadun.

The test has the look and feel of a video game. Seated at a touch-screen displaying a grid pattern and a central bright spot, the patient stares with one eye at the spot, then traces a finger around the visible portions of the grid as the computer records each motion. The screen contrast changes slightly, and the patient again traces the grid. This process is repeated for each eye until the computer generates a 3-D profile of the patient's visual field.

"The patient is playing the game while the machine is digesting the information," Sadun says.

For example, because patients suffering from macular degeneration have trouble seeing the grid pattern near the center but retain peripheral vision, they will trace a central hole on the screen. Those who also have a relative field defect will trace an ever-smaller circle as the grid pattern intensifies in brightness.

Fink created the program that permits the computer acquisition and analysis of the psychophysical techniques developed by Sadun. The two researchers have applied for a patent.

The Grid Test is quicker, simpler and more revealing than existing methods for characterizing the visual field. "It creates a greater sensitivity for detecting problems," says Sadun. "It provides quantitative measures for monitoring, and it characterizes the 3-D visual field, which makes a big contribution to diagnosis."

It also offers a powerful means of processing patient data – by saving all patient responses in a computer profile –

Other Stories

A Thinly Used Red

Line

The Los Angeles subway serves as a cautionary tale to Vancouverites rolling out their own mass transit experiment, dubbed SkyTrain. USC economist and policy expert Peter Gordon shed harsh light on the Southland's thinly used Red Line. County transit ridership of all kinds peaked in 1985 at about 500 million trips a year, Gordon recently told the *Vancouver Sun.* Despite a 12 percent population growth and almost $7 billion in mass transit investment, ridership is now below 400 million. "What does that mean to me?" Gordon mused. "It means a crashing failure. If you spend megabucks, and have no over-all effect on commuting patterns … what's the sense to it?"

and it's cheap to manufacture and easy to distribute. Since April, 40 patients suffering from macular degeneration, anterior ischemic optic neuropathy (AION) and optic neuritis have been assessed using the new technology. Sadun and Fink are now trying it out on glaucoma patients.

Other diseases and eye conditions the Grid Test will detect include detached retina, macular edema, central or branch retinal artery occlusions and some genetic impairments. The system also will detect, characterize and locate several types of brain tumors. For more information, call 1-800-USC-CARE.

CANCER TREATMENT

No More Chemo Crapshoot

THE DAYS OF educated guesswork may be ending where chemotherapy is concerned. USC researchers have developed a new technology that anticipates which type of chemotherapy drug is most likely to be effective against a patient's specific cancer before the treatment begins.

Peter and Kathleen Danenberg

The technology draws on research developed over 10 years by husband-and-wife team Kathleen and Peter Danenberg. She is a research lab specialist at USC/Norris Cancer Center; he is a professor of biochemistry and molecular biology at the Keck School of Medicine of USC. The Danenbergs also collaborated with Heinz-Josef Lenz, associate professor of medicine at the Keck School and scientific director of cancer genetics at USC/Norris.

"Kathleen and Peter Danenberg have developed a method that allows for the examination of gene expression in a single tissue section," says Lenz, who has treated hundreds of patients with gastrointestinal cancers. "This will revolutionize the way we can screen for chemoresistance." It means oncologists can tailor cancer treatments to best fit with each patient's genetic makeup.

TRADITIONALLY, SURGEONS remove at least a portion of a cancerous tumor for a biopsy before starting chemotherapy or radiation. Under the new approach, a sample of tumor tissue undergoes genetic analysis at the same time. The USC researchers have identified four important genetic markers in tumor tissue that can predict which tumors will respond best to certain types of chemotherapy. Whether one drug is effective against a particular tumor depends in large part on the levels of various enzymes that the tumor's cells produce, the

Photograph by Jeffrey Trachtman, eyesight illustration by Jon Conrad and subway illustration by Matthew Martin,

Danenbergs have found. That amount varies from patient to patient.

In colon cancer cases, such genetic analysis can make the difference between 100 percent accuracy and just 15 percent accuracy of response to a chemotherapy regimen. (Response to a drug means the tumor's volume shrinks by at least half.)

If the tests show that a patient is not likely to benefit from chemotherapy, oncologists have several other therapies they may try, as well as clinical trials for newly developed drugs. The information also helps oncologists decide whether a patient would respond better to a combination of chemotherapeutic drugs, instead of one alone.

Currently the tests are effective in colon, stomach, pancreatic and lung cancers. But the list is growing as the Danenbergs investigate markers associated with a wider range of anti-cancer drugs. The researchers have also developed a test to monitor patients' success while chemotherapy is underway. Through blood analysis, they measure changes in the DNA shed by a patient's tumor. The same technique makes it easy to follow up after chemotherapy to ascertain whether a tumor is growing back.

USC/Norris oncologists are now using the tests on patients receiving treatment at the hospital. More information is available on the Web (www.responsegenetics.com).

– Alicia Di Rado
