

Contemporary

MEDICINE

News from Jefferson

Volume 5 No. 1



Clearing the Pathways of the Heart

Also in this Issue:

- Geriatric Psychiatry Expands with Need
- OB Home Care Makes Home Wait Safer
- Liver Cancer Effort Combats Hepatitis

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On the Cover



Last December, Charles Bass, of the Wynnefield section of Philadelphia, developed unstable angina while at home. Despite his discomfort, Mr. Bass drove himself to the subway, took the subway to Jefferson's campus, and walked into the ER. Jeff cardiologists promptly performed a cardiac catheterization on Bass. When he was found eligible for experimental treatment with rt-PA, Mr. Bass agreed, and the staff enrolled him in the study. In the CCU, clinicians administered the study infusion under the double-blind protocol. The Jeff investigation could expand the uses for rt-PA to treating patients in such

preinfarctional states. The thrombolytic agent has been widely hailed for the lives it has saved in stabilizing acute MI patients. In Jefferson's CCU, Mr. Bass's angina quickly resolved. His cardiologists performed a follow-up catheterization and discharged him one week later, on medical therapy. He has been well since. A stress test in February showed him significantly improved.

Mr. Bass is retired from a career first as a policeman and then as a postal worker. Among his hobbies, he enjoys building bird houses for his neighbors.

Inset photo: This 15mm., stainless-steel stent is helping Jefferson physicians treat patients whose coronary artery disease cannot be resolved by standard balloon angioplasty alone. After a lesion is dilated with standard angioplasty techniques, the balloon is deflated. The guidewire is left in place across the stenotic vessel. A second balloon, fitted with a stent, is threaded through the artery and inflated. The stent dilates to fit the vascular opening. In time, endothelial cells lining the blood vessel grow over the stent, incorporating it into the vessel wall.



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Geriatric Psychiatry Widens Role in Long-Term Care

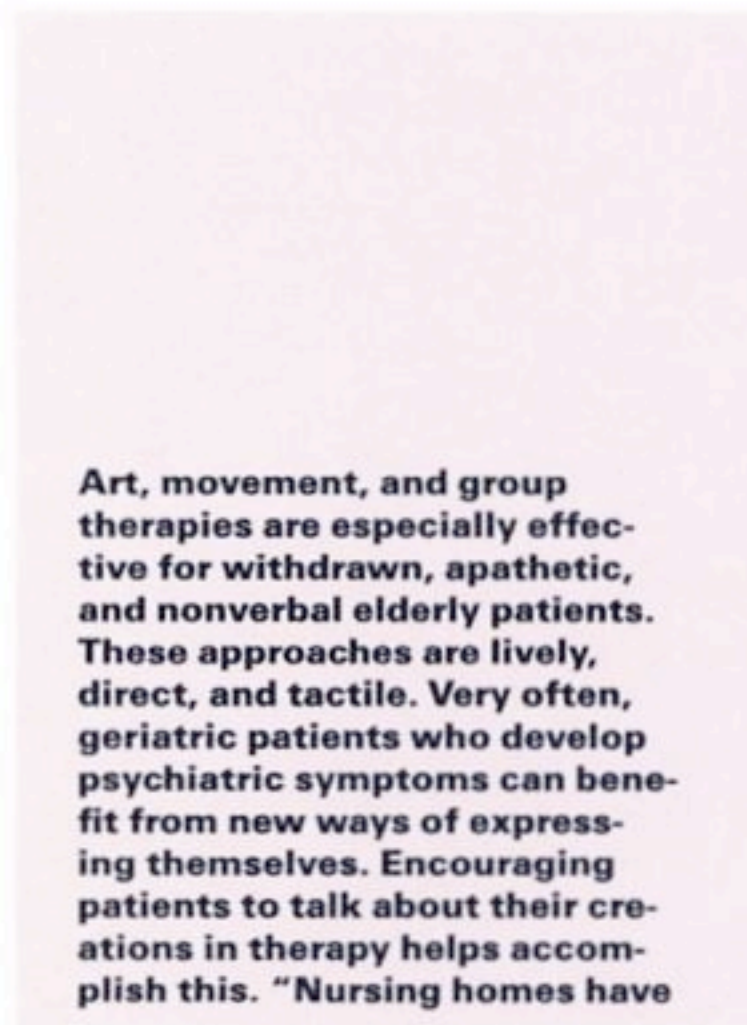
With a burgeoning strain on the long-term-care system for the elderly—a problem that threatens to reach crisis proportions in the next half-century—specialists in psychiatric problems of the institutionalized elderly are reaching out to the community to create services and training with wider impact. Two important components of this effort, day-hospital services and nurse training in geriatric mental health, are now led in the area by Jeff's geriatric psychiatry group.

In a rare and much needed enterprise for the region, the division of geriatric psychiatry at Jefferson now runs a partial (or day) hospital program for nursing-home patients who show indications of depression or other psychiatric problems. A clinical-care team that can provide complete evaluation of such patients organizes regular group, individual, and creative arts therapy.

"One of our goals is to prevent these patients from having to be hospitalized," explains the division's new director, Rod Pelchat, M.D., who is also a Ph.D. psychologist and a graduate of fellowship training in geriatric psychiatry. His 17-person team conducts day hospitals at three sites in the area, serving a total of 30 nursing homes. It has now opened the program to non-nursing-home patients as well.

Sharing Knowledge

The Jeff division also operates the Long-Term-Care Training Institute, which contracts with social agencies, nursing homes, and others to train nurses in geriatric mental health. Such nurses are now required by the state



Art, movement, and group therapies are especially effective for withdrawn, apathetic, and nonverbal elderly patients. These approaches are lively, direct, and tactile. Very often, geriatric patients who develop psychiatric symptoms can benefit from new ways of expressing themselves. Encouraging patients to talk about their creations in therapy helps accomplish this. "Nursing homes have

a great need for psychiatric day-hospital programs offering this kind of help," says Rod Pelchat, M.D., Ph.D., the new director of Jefferson's geriatric psychiatry and partial-hospital programs. "We can make recommendations for after-care to the long-term-care institution or to the primary or referring physician. Day care like this guards against psychiatric hospitalizations."

to fulfill a specified amount of special training, and the Jeff program is state approved.

The multidisciplinary team of psychiatrists, psychologists, social workers, nurses, and occupational therapists holds classroom instruction both at Jefferson and in the field. Nurses thus trained in turn train aides who work in long-term-care homes. "Our instruction is cascading down through several levels of care-givers," explains Jeanette Bressler, M.S.W., coordinator of the Institute.

Leading Dementia Clinic

As an example of a full-service geriatric psychiatry team, these division clinicians also have several other areas of primary activity:

- Staff neuropsychologists facilitate the early diagnosis and follow-up, important to a host of geriatric psychiatric conditions.

- The group's Dementia Evaluation Center, a combined service with the Dementia Clinic in Jeff's department of neurology, comprehensively evaluates memory deficits. The team is now conducting drug trials for treating Alzheimer's disease (*see Contemporary Medicine, March 1989*).

- Regular outpatient psychiatric diagnoses for conditions such as transitional and situational depressions and anxieties are a mainstay of the clinicians' work with the elderly.

"As for inpatient services, the Delaware Valley remains underbedded in geriatric psychiatry," notes Dr. Pelchat. His division hopes to establish a larger, dedicated inpatient unit for geriatric psychiatry patients.

To contact Jefferson's division of geriatric psychiatry, call 215 955.8780. □

Metabolic Changes in Septic Patients May Mean New Feeding Strategies

Sepsis is a major clinical problem, especially in transplant, trauma, and GI surgeries. Changes in lipid metabolism, evident in elevated blood triglycerides, have long been observed in the chronically septic patient. Traditionally, such patients have been fed a total parenteral nutrition (TPN) diet that has glucose as the main source of calories. This regimen often leads to hyperglycemia and insulin resistance.

A group of NIH-funded Jeff researchers, headed by Susan Lanza-Jacoby, Ph.D., associate professor of surgery, is in the midst of studies that address these problems and that could change the composition of feeding formulas for such patients. The team has discovered that the basis of high lipid levels in septic animals is not an hepatic oversecretion of lipids but a failure of the body to clear lipids.

Like the human patients they model, experimental septic animals also end up with fatty livers. But the specific role of the liver in these phenomena had not been studied before. Using cultures of hepatocytes from fatty livers, the team found that the liver cells in these animals synthesize lipids more rapidly. "The cells, however, are not able to secrete all the lipids that they synthesize. This is contributing to the fatty infiltration of the liver in sepsis," explains Dr. Jacoby.

Recommends Lipids

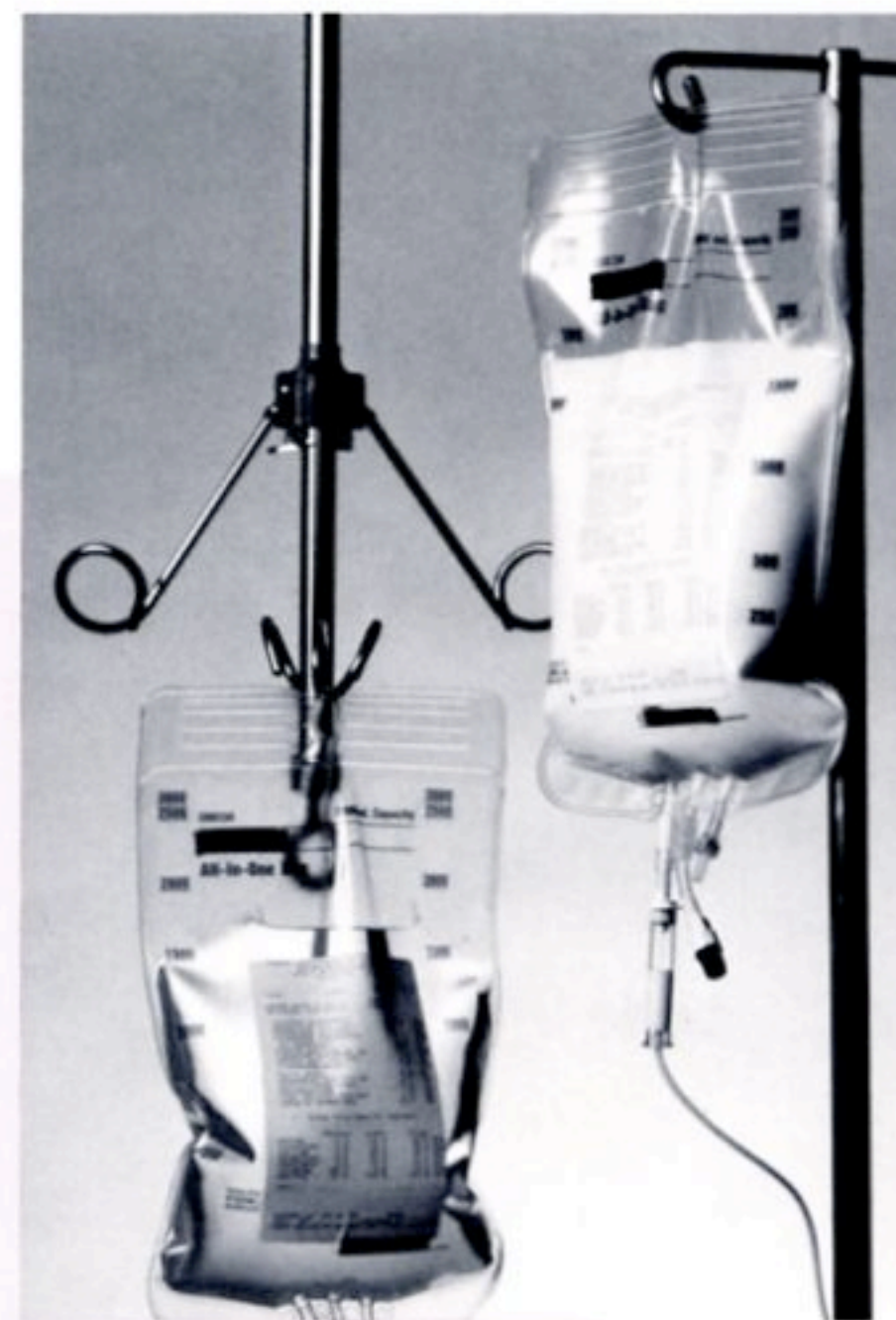
Jacoby's investigative group found another indication of aberrant liver function in septic animals when it observed unusually high serum concentrations of apoprotein B, found predominantly in very

A rare Jefferson group has been researching the composition of diets, routes of administration, and feeding schedules for patients who must receive their food by total parenteral nutrition. Some of the researchers' conclusions that have already been put into practice are that cycling (12 hours on, 12 hours off) in TPN and gastric feeding is best for most patients. They are now looking at shifts in metabolism in response to infection. Their findings indicate that modifying lipid intake can be highly beneficial in long-term nutritional support of the septic patient. Ketone bodies substituted for part of the lipid calories may also serve as a new energy source for these patients. The group is currently investigating this possibility.

low-density lipoproteins. Septic animals appear not to clear this component, because their livers fail to take it up normally. This defect may also contribute to the high elevation of blood triglycerides.

Septic animals also tend to stop eating. Thus, the Jeff scientists performed the initial studies with fasted animals. To model the patient with sepsis more precisely, the group has done further experiments with animals fed a diet, by catheter, similar to that used in the hospital.

Although still searching for basic mechanisms that



Brad Bower

may influence fatty infiltration of the liver, the researchers found that animals that are intragastrically fed a balanced solution containing glucose plus fat as the sources of nonprotein calories do not develop hypertriglyceridemia. Using labeled lipids, in fact, they found that these fed septic animals were able to clear lipids as well as control animals do.

"The ability to clear triglycerides depends in part upon the nutritional state of the host. Fed septic animals clear lipids better than fasting ones," concludes Jacoby. "Septic patients are hyper-

metabolic. They may need the addition of a dense caloric source such as fats to prevent breakdown of muscle tissue."

Jacoby, however, does not see the use of fats as the answer to all the metabolic problems of sepsis, since fatty infiltration of the liver still occurs with septic animals that are fed. The answer may lie in current work with ketone bodies. The team found that the heart, muscle, kidney, and brain tissue of septic animals use more of these nutrients. It is now exploring adding ketone bodies to the animals' diets. □

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Birth Defects: Risks, Causes, and Prevention

Also in this Issue:

- Quad Spinal Patient Fathers Child
- New Asthma Drug Hailed As Promising
- Stent Used To Treat Left Main CAD

Birth Defects: Assessing Causes and Risks, Seeking Preventive Knowledge

The human conceptus, first subjected to genetic chance at its creation, must grow to fruition at the mercy of potential hazards both innate and environmental, natural and man-made. The number of possible dangers, new and long-standing, that have been recognized for the human gamete, embryo, or fetus seems to continually outstrip the rate at which such risks can be investigated or tested.

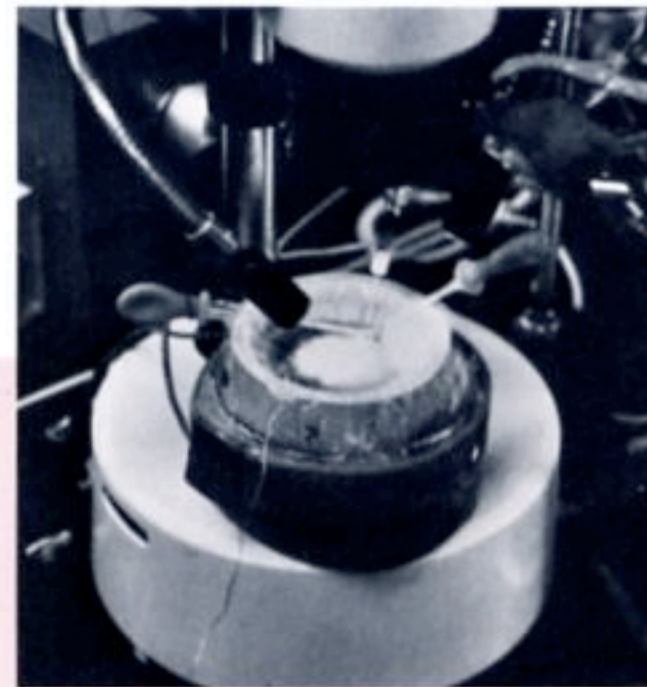
At academic health centers, the very makeup of the groups that study this conundrum illustrates the sprawling nature of the birth defects question. Jefferson's departments of pediatrics, anatomy, medicine, and ob-gyn, among others, collectively comprise one of the largest developmental biology groups in the country. They fulfill requests for consultations locally and from all over the world, from industry and family doctors alike.

Of particular concern to physicians are the risks that medicine itself may create for the reproductive process. In fact, one procedure commonly performed on the fetus, the ultrasonogram, continues to be studied for safety. Animal research on its effects has been concerned with early gestation and congenital malformations. Until recently, little attention had been given to ultrasound in mid- to late gestation, the period when the central nervous system of the mammalian fetus is developing most rapidly.

In response to an NIH consensus meeting and a government request, teratologists and radiologists at Jefferson have been sonifying pregnant rats and studying the functional consequences. Using a special exposure chamber

built by collaborating Drexel University physicists, the scientists measured parameters indicating CNS function in rat offspring that had received one and three times the normal amount of 5.0 MHz ultrasound received by human fetuses.

Last month, at a national pediatrics meeting, well-known Jefferson developmental biology program director and pediatrics chairman Robert Brent, M.D., presented the findings of this work. The Jeff researchers, also led by anatomist Ronald Jensh, Ph.D., and ultrasound division chief Barry Goldberg, M.D., reported that they found no significant dose-related alterations in neonatal development or postnatal growth as a result of ultrasound. They are now continuing the work at different frequencies and strengths to determine the limits of the safety range.

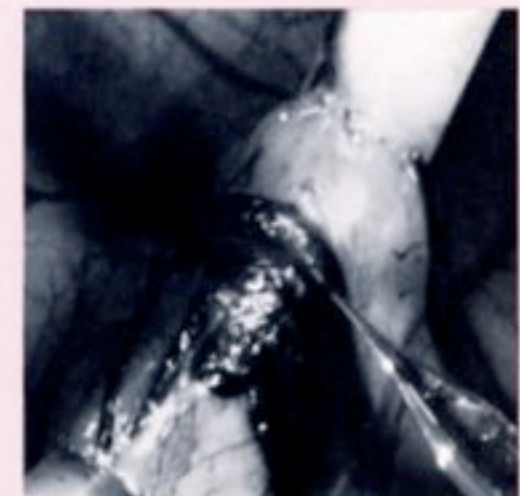
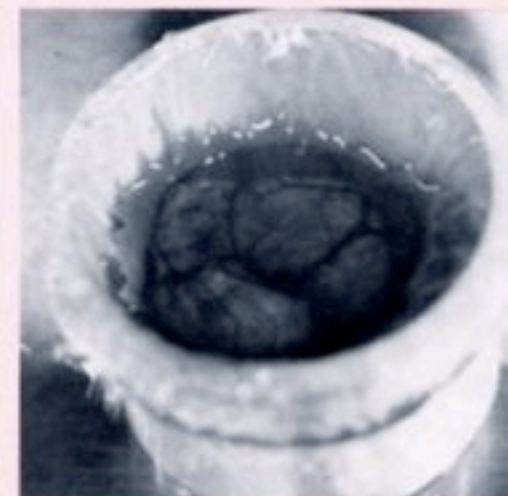


Apparatus can measure blood pressure of the embryo in response to salt, adrenalin, other "maternal" stimuli.

Sponsored by the March of Dimes and the National Institute of Child and Human Development, Jeff orthopaedic researchers set out to discover how calcium and other positively charged ions are pumped across placenta, and what events cause limbs to develop, elongate, and organize into structures. The work required a calcium-deficient embryo model isolated from the mother. Researchers had previously identified the egg shell as the calcium source for chick embryos. This

provided the clue for the Jeff team, which became the first to conduct long-term cultures of shellless chick embryos developed in a plastic bag.

The model may have many expanded applications, because it allows researchers to perform micromanipulations on the embryo—adding back calcium, for example—and thus to examine physiologic and biochemical parameters of development about which very little is known.



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News from Jefferson

Volume 4 No. 4



Understanding Alcohol Abuse and Its Effects

Also in this Issue:

- Advances in Managing Thyroid Tumors
- JeffSTAT Transports Critical Patients
- Care for Attention-Deficit Children

Understanding Alcohol's Effects: Advances Seen at Many Levels

In medical school, it was often said that a physician who knew syphilis knew medicine, because syphilis is a disease that affects all body systems. Today, clinicians in the forefront of research on the effects of alcohol consider such a statement just as appropriate to alcoholism.

Physicians in every specialty and hospital service see alcohol-related conditions. Research also indicates that at any time in the average hospital roughly one-third of inpatients have some drug or alcohol-abuse component as a factor in their illness. Although a national cocaine epidemic has drawn attention away from alcohol abuse, alcohol is still a much more prevalent substance-abuse problem than drugs.

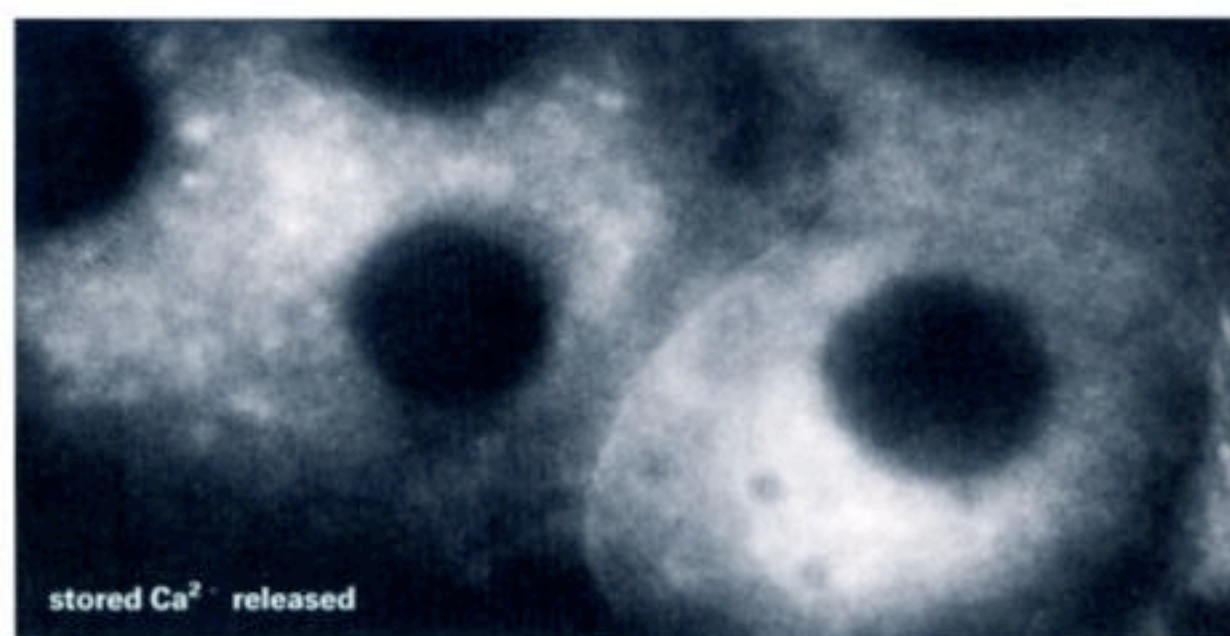
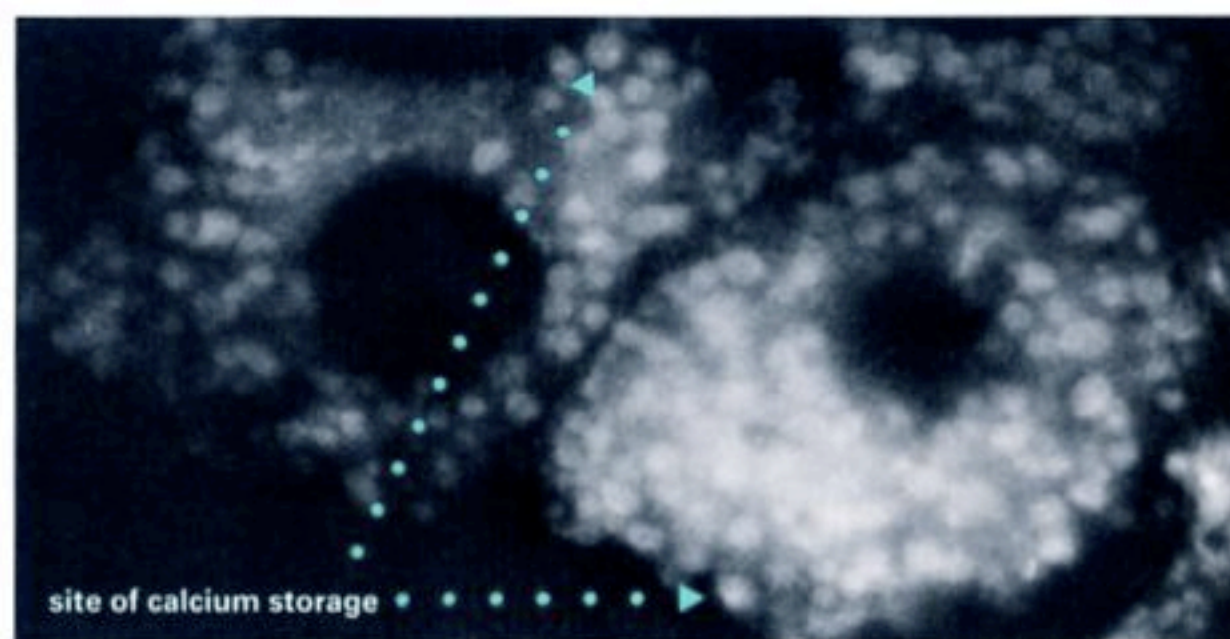
Length of Acute Care Linked to Outcome

Increasing in numbers and recognition at centers like Jefferson—which has one of the largest alcohol research programs in the country—is the dual-diagnosis patient. In many health-care settings, patients who have a psychiatric disturbance and are also substance abusers are shuttled between psych, medical, or detox units, where staffs are not always prepared for the additional component of the patient's condition. Leading a trend toward greater awareness of this problem are services such as Jefferson's Thompson 12 Program, a combined-disorders inpatient unit that has grown to occupy a 17-bed floor.

The staff of the division of substance-abuse programs at Jefferson is examining the relationship between length of inpatient stay for alcohol patients and treatment outcome. As for many other types of patients, length of stay for alcohol-abuse patients has decreased nationally. "We're asking whether this is because hospitalized alcoholics are being better treated or undertreated," explains Edward Gottheil, M.D., director of the division. "Previous attempts to answer this question have not considered the initial degree of severity of the patients' illnesses."

Measures of severity of alcohol abuse are readily available. In collaboration with the Coatesville V.A. Medical Center and the University of Pennsylvania, Jeff researchers have recently provided results showing that patients who

stay in inpatient treatment longer do better and therefore probably have lower treatment costs through time. They presented their data at the national meeting of the American Medical Society of Alcoholism and Other Drug Dependencies. Gottheil, who is on a Institute of Medicine of the



Scientists in Jefferson's Alcohol Research Center use new techniques and instruments to reveal the ravages of ethanol. With the laser-scanning confocal microscope, Andrew Thomas, Ph.D., creates a real-time scan of living cells and their structures. The researcher makes use of molecules that fluoresce as, for example, they combine with calcium in hepatocytes (*top*) under hormonal influence (*bottom*). Ethanol can mimic the effects of hormones such as epinephrine, and calcium is a major second messenger for the metabolic effects of these agonists. Thomas creates a digital image of the cell,

picks out specific locations and enhances or zooms in on them, or produces a series of images to watch a process occur across a cell.

In a separate project, colleague Christopher Stubbs, Ph.D., takes advantage of the fact that fluorescent decay and cell membrane dynamics occur on the same time scale, around a billionth of a second. To measure these events, he uses a laser-excited, time-resolved technique that enables him to study specific key regions of cell membranes and the perturbations caused by alcohol at the molecular level.

Do Sunscreens Cause Hip Fractures in the Elderly?

Studies have shown that elderly people often have marginal vitamin D status, and that the ensuing problems of calcium maintenance can lead to osteoporosis and osteomalacia. Research published in the last several years by Lois Matsuoka, M.D., Jefferson associate professor of dermatology, indicates that a portion of seniors may also be unwittingly placing themselves in danger of bone disease by screening themselves excessively from exposure to the sun.

Two years ago, Matsuoka and coworkers showed that when normal volunteers applied sunscreens to their bodies and were irradiated in a phototherapy chamber, the sunscreen prevented cutaneous vitamin D synthesis, as measured by vitamin D₃ in the blood. Last year, the same researchers drew samples from long-term sunscreen users during the summer months and compared them to age- and sex-matched non-sunscreen users from the same geographic area. Sunscreen users had a range of 25-hydroxyvitamin D (25-OH-D) serum concentrations significantly lower than normal. This indicator is the most accurate for long-term vitamin D status.

Two of the sunscreen users were clearly vitamin D deficient. The study prompted a lengthy editorial of concern about photoprotection and vitamin D status in the elderly in the *Archives of Dermatology*, which published Matsuoka's results. "The elderly don't compensate as easily through their diet, because they eat less and absorb vitamin D less efficiently in the digestive tract," says Dr. Matsuoka.

Advises Testing, Supplements

In a recent project, funded by the Dermatology Foundation, Matsuoka and colleagues tested subjects to determine how much sunlight is needed to stimulate cutaneous vitamin D conversion. They devised a formula from their results that shows a direct and exponential relationship between the two

factors, and that establishes the minimal amount of outdoor exposure necessary to produce vitamin D (18 mJ/cm²).

"Individuals in high latitudes, such as the Delaware Valley, do not receive adequate exposure to the sun in an average, brief exposure to stimulate vitamin D production," says Matsuoka. "They have a greater dependence on body stores and dietary supplies to meet their winter requirements. However, studies have shown that the elderly have difficulty achieving high enough summer levels of 25-OH-D to maintain adequate levels through the winter."

Vitamin D deficiency is not uncommon among older people who suffer femoral fractures. Matsuoka is now working with orthopaedist Eric Hume, M.D., director

of Jefferson's Bone Disease Center, on a study aimed at determining whether or not osteoporosis patients represent a special subgroup of the elderly who inefficiently convert vitamin D precursors.

"We believe that in some older patients with a poor diet, poor vitamin D absorption, or poor skin conversion, a lack of sun could push them into a real vitamin D₃ deficiency," says Matsuoka. "Our advice for the primary-care physician is to be cognizant of having the 25-OH-D test done on patients at risk, and then to prescribe vitamin D supplements for those whose results are unsatisfactory. Some of the elderly may also want to consider indulging in suberythemal doses of sunlight." □



Leif Skoogfors

Seeking to protect themselves from skin cancer and skin aging, the elderly make considerable use of sunscreens. Recent studies headed by a Jeff dermatologist associate long-term sunscreen use with low body stores of vitamin D in some persons, due to the fact that sunscreens prevent skin from absorbing UV-B light. Some individuals may put themselves in danger of bone disease by blocking this source of the nutrient. Despite wide attention to calcium supplements, vitamin D may actually be a better preventive of bone disease and encourager of bone maintenance. The elderly may avoid another primary source of vitamin D, fortified dairy products, for any number of reasons ranging from lactase deficiency to the desire for a low-fat diet. Although cutaneous synthesis is a more important source of vitamin D than diet, experts say that eating fish or taking vitamin D supplements can compensate.

Psychooncologists Deal with Emotional Sequelae of Cancer

Cancer, America's most feared illness, aside from AIDS, produces a greater emotional reaction in patients and their families than most other serious diseases. "Cancer is considered especially undesirable, and is reacted to as if it were a 'dirty illness,'" explains Troy Thompson, M.D., Jefferson's chairman of psychiatry and human behavior. "Patients often feel disgusted and ashamed."

Because of the psychological issues surrounding cancer, leading cancer centers are now developing subspecialty services to deal with the psychiatric ramifications of the disease. Providing such care at Jefferson is Elisabeth Shakin, M.D., who completed a two-year fellowship in psycho-oncology at Memorial Sloan Kettering Cancer Center, in New York. Shakin was chief fellow in psycho-oncology and one of the most outstanding graduates of the program. She is currently serving as a liaison to the Jeff cancer specialists as part of her role on Jeff's psychiatric consultation-liaison service.

"Psycho-oncologists may treat patients at any phase of the disease," says Dr. Shakin. "This includes prior to diagnosis—as in cancer-phobic patients—as well as after diagnosis; before, during, and after treatment; at the time of a recurrence; while dying; or near death. In addition, we're called on to help cancer survivors, some of whom have difficulty with reentry into normal life."

Shakin recently treated a patient in his 50's, a manual laborer who had to undergo an amputation of his arm and shoulder for chondrosarcoma.



D. W. Mellor

She treated him with medication and psychotherapy for depression, poor self-esteem, phantom limb pain, and alterations in body image. She also arranged for vocational counseling. Dr. Shakin is additionally serving as the psychiatric liaison to the Jefferson Pain Center.

Individual patient work by these new specialists may also include education, psy-

Cancer can deeply affect patients and their emotional support systems. The new subspecialty of psycho-oncology trains medical professionals who dedicate their skills to the cancer patient. "One difference between this work and a more traditional psychotherapy relationship is our flexibility in terms of the treatments we're prepared to provide. We may shift between individual, group, family, or crisis-intervention techniques during the dramatic fluctuations that can occur in the course of the disease," says


Elisabeth Shakin, M.D., shown here with a patient at Jefferson's Bodine Center for Cancer Treatment. Antianxiety or antidepressant drugs are frequently beneficial to these patients. Shakin also cares for AIDS patients, a group that often suffers similar psychological repercussions. Two professional groups that have arisen out of interest in this new subspecialty area are the International Psycho-oncology Society and the American Society of Psychiatric Oncology/AIDS.

treatment, the patient no longer experiences the support of intense and frequent contact with physicians and therapists. Fears of recurrence often emerge at this point."

Problems Can Be Medical as Well

Physical causes may underlie psychiatric symptoms. Metastases in, or radiation therapy to, the central nervous system are associated with such psychiatric symptoms as depression and impaired cognition. In another example, the psycho-oncologist may discover that a patient referred for anxiety suffers from akathisia, a side effect of the neuroleptics used as anti-vomiting agents during chemotherapy.

Other chemotherapy patients may suffer anticipatory nausea and vomiting during each journey back to the hospital. "We may use relaxation therapy or other approaches that help to distract them from anxiety-producing stimuli," says Shakin. "In general, we seek to give patients the feeling of gaining more control over what's happening to them."

To contact Jefferson's psychiatric consultation-liaison service, call 215 928.6683. 

chotherapy, and behavioral techniques. Shakin cites the example of breast cancer patients, who are often given a choice by their surgeons of either lumpectomy or mastectomy. "Facing breast cancer is obviously a disturbing, tension- and anxiety-producing event. But this can be true as well for its treatment. For instance, during the period after radiation