PATHWAYS

THE DECADE OF THE BRAIN

This special insert to Clinic News is published to update physicians on recent developments in diagnostic and therapeutic procedures and advances in research through the Shands Neurological Center at the University of Florida. The Shands Neurological Center is a joint endeavor of Shands Hospital and the UF College of Medicine to improve patient access to strong existing programs and enhance relationships between physicians. UF neurologists and neurological surgeons who practice at the Shands Neurological Center are recognized internationally for their development of improved techniques and high-technology systems for detecting and treating complicated disorders of the brain and other parts of the central nervous system.

This insert was produced by UF's Shands Clinic Communications in the office of Health Science Center Communications. If you need additional information regarding any of these articles or the Shands Neurological Center's services, call 1-800-633-2122

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THE DECADE

The human brain, a three-pound mass of interwoven nerve cells that controls our activity, is one of the most magnificent — and mysterious — wonders of creation. The seat of human intelligence, interpreter of senses and controller of movement, this incredible organ continues to intrigue scientists and laymen alike.

Over the years, our understanding of the brain — how it works, what goes wrong with it when it is injured or diseased — has increased dramatically. However, we still have much to learn. The need for continued study of the brain is compelling: millions of Americans are affected each year by disorders of the brain ranging from neurogenetic diseases to degenerative disorders such as Alzheimer's, as well as stroke, schizophrenia, autism, and the impairments of speech, language and hearing.

Today, these individuals are justifiably hopeful, for a new era of discovery is dawning in brain research…

…Now, therefore, I, George Bush, President of the United States of America, do hereby proclaim the decade beginning January 1, 1990 as the Decade of the Brain. I call upon all public officials and people of the United States to observe that decade with appropriate programs, ceremonies and activities.

In witness whereof, I have hereunto set my hand this seventeenth day of July in the year of our Lord nineteen hundred and ninety, and of the independence of the United States of America the two hundred and fifteenth.

— From President Bush's address proclaiming the 1990s as The Decade of the Brain

O F T H E B R A I N

Dear Colleagues:

I believe we are on the threshold of the most promising decade of the 20th Century.

The decade of the 1980s brought dramatic changes in the neurosciences, and I anticipate no less of the 1990s. We need to mount a national campaign to focus on the opportunities in basic and clinical research that can be realized if the necessary resources are made available. Without research, our specialty will stagnate. Older procedures will not be improved; new procedures will disappear. One of the major goals of the Decade of the Brain is to increase resources so that 50 percent of approved grants can be funded rather than less than 20 percent.

One of my fondest hopes is that we will be able to create a major new philanthropic organization during the Decade of the Brain. The organization, called the American Brain Association, would be modeled after the American Heart Association (AHA) and the American Cancer Society (ACS).

The American Brain Association would bring lay leaders and neurologists, neuroscientists, and neurosurgeons into activities involving patients, physicians, hospitals, medical schools and research facilities from communities across the nation. It would mount a national fund-raising drive. It would provide funds for equipment in hospitals, educational programs for patients and physicians, and research and training grants. Funds would be raised to endow professorships. As with the heart and cancer fundraising groups, the dollars raised would purchase facilities that would become the focal point for educational programs, fundraising, and public relations. The public has never had an opportunity to contribute to a national philanthropic organization for the brain that has the breadth of activities seen with the AHA and the ACS. The public will respond to the excitement and challenge of programs related to the brain.

The benefit to mankind of increasing knowledge of the brain is incalculable. The activities of the Decade of the Brain are designed to emphasize the staggering human and social cost of brain disorders and to document the tremendous opportunities presented by recent and anticipated research advances. They have the potential to help the blind see, the deaf hear, the paralyzed walk, and the demented learn.

The 1980s brought dramatic changes. The application of magnetic resonance imaging (MRI) to the brain and spine has yielded a revolution in diagnosis comparable to that brought about by computerized tomography in the 1970s. Computerized tomography and magnetic resonance imaging have revitalized stereotactic surgery.

New vistas that opened in the 1980s include radiosurgery, transplants to the brain, and computer-assisted neurosurgery. New contrast agents have improved myelography. Digital techniques have improved angiography. Advances in electronics and computers have made it commonplace to monitor pathways in the nervous system even as we operate on them. Almost every aspect of our practice has been touched by the changes occurring in one decade.

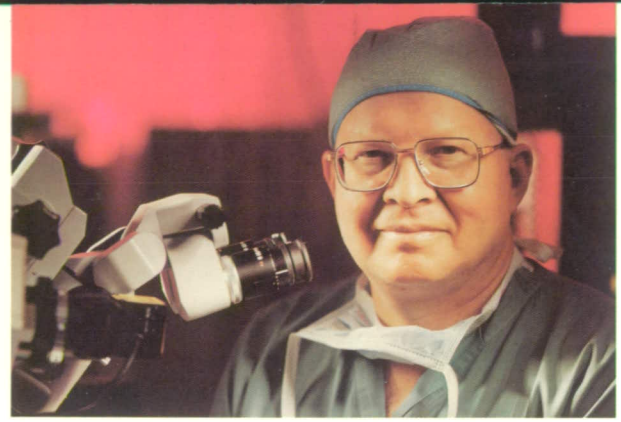
In my early years, I never imagined that life would yield such an exciting mission as being a physician or a neurosurgeon. The fact that highly trained teams of professionals are allowed to work for days, using mankind's most sophisticated and expensive technology, trying to improve the life of one man or woman is a reflection of the high value our society places on the individual.

Our work is done in response to the idea that human life is sacred; that it makes sense to spend years of one's life in study in order to be able to help others.

Our training brings into harmony a knowledgeable mind, a skilled set of hands, and a well-trained eye, all guided by a caring human being. The skills we use have been described as the most delicate, the most fateful, and to the layman the most awesome of any profession.

After years of retirement, J. Lawrence Pool, who led the neurosurgery program at Columbia University, recently wrote, "As I look back on the pattern of my life I see how fortunate it was that I had chosen a career in neurosurgery, which I passionately loved despite its long hours and many grueling experiences." He concludes with a statement about his belief that the best surgeons have a strong sense of compassion.

It is important that we grow in compassion just as we grow in competence. Competence is the possession of a required skill or knowledge. Compassion, on the other hand, does not require a skill or knowledge; it requires an innate feeling, commonly called love, toward someone



else. Both competence and compassion need to be developed simultaneously, as the giant oak develops its root system along with its leaves and branches. Competence without compassion is worthless. Compassion without competence is meaningless. It is a great challenge to competently and compassionately guide one's patient through neurosurgery. No experience draws more frequently on the phrase from the Book of Psalms, "...although I walk through the valley of the shadow of death..." Our competence should be reflected in our training, knowledge, and skill. Our compassion should be reflected in kindness, sincerity, and concern.

I would like to close with the following prayer for physicians sent to me by a patient with a meningioma. "Lord, Thou Great Physician, give skill to my hands, clear vision to my mind, kindness and sympathy to my ears. Give me singleness of purpose, strength to lift at least a part of the burden of my suffering fellow men, and a true realization of the rare privilege that is mine."

Albert L. Rhoton Jr., M.D.
From Dr. Rhoton 's Presidential address to the American Association of Neurological Surgeons;
R.D. Keene Family Professor and Chairman
Department of Neurological Surgery
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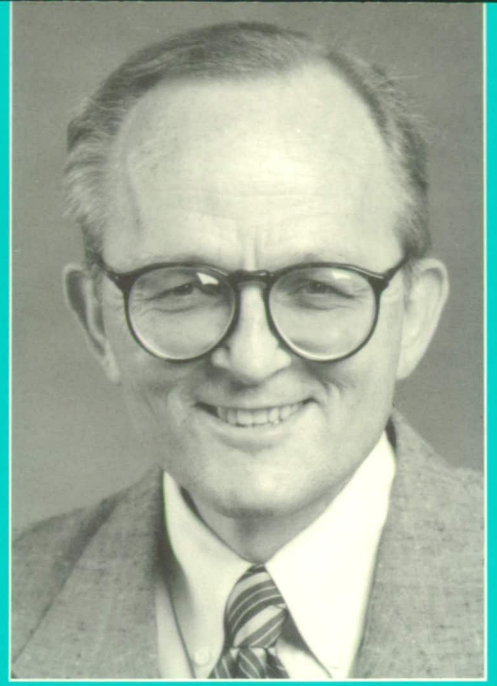


UF APPOINTS NEUROSCIENCE CHAIRMAN LUTTGE TO DIRECT UNIVERSITYWIDE BRAIN INSTITUTE

by Larry Lansford

A University of Florida College of Medicine scientist and champion of brain research has been chosen to head the development of a university-wide brain institute at UF. The appointment sets in motion a plan to develop one of the world's leading centers of brain research at UF.

William Luttge, Ph.D., chairman of the medical school's neuroscience department, becomes director of the new University of Florida Brain Institute, established to foster collaborative studies on the brain and central nervous system among more than 120 faculty researchers campuswide.

Luttge is an ardent advocate of brain research. To raise statewide awareness of the increasing importance of brain research, he helped convince the Florida Legislature last year to pass legislation matching President Bush's earlier proclamation designating the 1990s as the "Decade of the Brain." He has been working with legislators again this session to increase support of the spinal injury research programs at UF and the University of Miami through Florida's Impaired Drivers and Speeders Trust Fund.

"Dr. Luttge's organizational abilities and his broad vision of the neurosciences make him the logical choice as brain institute director," College of Medicine dean Allen Neims, said. "The brain institute is one of the major initiatives in the college's strategic plan. It eventually will involve almost every medical department and many other colleges across the campus."

As a member of the brain institute task force, formed in 1989, Luttge has played a key role in the planning and development of the institute. The institute is the "brainchild" of neurosurgery chairman Albert Rhoton, M.D., and pathology professor Richard Smith, M.D. Neurology chairman Melvin Greer M.D., and other faculty members also were instrumental in its formation.

Dean Neims says development of a major brain institute can help UF continue to move into the ranks of the nation's best medical universities. Clinical and research programs involving brain and nervous system disorders, including paralyzing spinal cord injuries, are already considered one of the College of Medicine's "magnet programs," attracting outstanding scientists, graduate students and physicians to UF.

"The brain institute can take the College of Medicine and the University of Florida to the cutting edge by bringing together our top scientists and physicians from a variety of disciplines, ranging from numerous specialties in medicine and veterinary medicine to electrical engineering and computer science," Neims said.

Neims said spinal cord and head injury is one of the first areas of study the institute will emphasize. UF is considered a world leader in spinal cord regeneration research, with two eminent scholar professorships (funded by the Charlie Mack Overstreet family of Polk County) devoted to that field of study. Before the Decade of the Brain ends, UF officials hope to break ground on a brain institute facility near the Health Science Center to house its clinical and research programs.

Luttge, besides serving as institute director, will remain as neuroscience chairman, a position he has held since 1978. His major research interest involves investigating the effects of steroid hormones on brain function.

NEW GRID SYSTEM HELPS PHYSICIANS LOCALIZE AND SAFELY RESECT AREAS OF BRAIN WHERE EPILEPTIC SEIZURES OCCUR

by Quenta Vettel

A small sheet of plastic embedded with electrodes is enabling University of Florida physicians to better localize and analyze the precise area of the brain where seizures occur in patients with epilepsy, thus allowing neurosurgeons to resect that area more safely.

The seven-centimeter square grid is sutured directly on the surface of the brain and, over the next one to two weeks, a multi-disciplinary team of UF healthcare professionals monitors the patient's brain activity to determine the further course of action.

"With this grid we can record the patient's brain waves directly from the cortex, thus eliminating much of the interference that's seen when monitoring from the skin. Equally important, we can electrically stimulate portions of the brain and induce a fully reversible functional paralysis on a part of the brain with the patient in a waking state," says Robin L. Gilmore, M.D., associate professor of neurology and pediatrics. "This allows us to predict what would likely happen to the patient if that area of the brain were resected."

The grid, developed in the mid-1980s at the Cleveland Clinic but still limited in its availability, works best in patients with extratemporal epilepsy or with people whose seizures originate in the posterior area of the dominant temporal lobe. It is estimated that around 300,000 American epileptics fail to respond to medical management and might be candidates for seizure surgery.

With the grid, UF physicians can cover a much greater area of the brain than they could with the more commonly used strips. The strips, narrow sheets of plastic embedded with electrodes, are combined with the grids for greater coverage. One drawback is that to place the grids, surgeons must perform a craniotomy, while the strips only require burrholes in the skull.

"Because the grid requires a craniotomy, there is more discomfort for the patient during the first few days after surgery," says Gilmore. "But to get the same degree of localization with the strips, we'd have to use 10 to 16 strips and we couldn't do that because that many burrholes would dangerously weaken the skull."

By combining the grid testing with other diagnostic tests including the electroencephalogram, MRI, CT and SPECT scan and neuropsychological testing, physicians look for all results to point to the same localized area of the brain.

To execute the procedure, UF neurosurgeons first perform the craniotomy and then suture the flexible grid directly to the cortex of the brain. "The grid is silastic and the electrodes are built into it," says Gilmore. "We use a grid that has electrodes made of platinum instead of stainless steel because the platinum electrodes are compatible with the use of magnetic resonance imaging. In most cases we use a combination of grids and strips to cover all the areas of the brain we need to monitor."

Wires are attached to the electrodes and the surgical opening is closed. The Gilmore-led team then spends the next one to two weeks recording seizure activity and stimulating the brain.

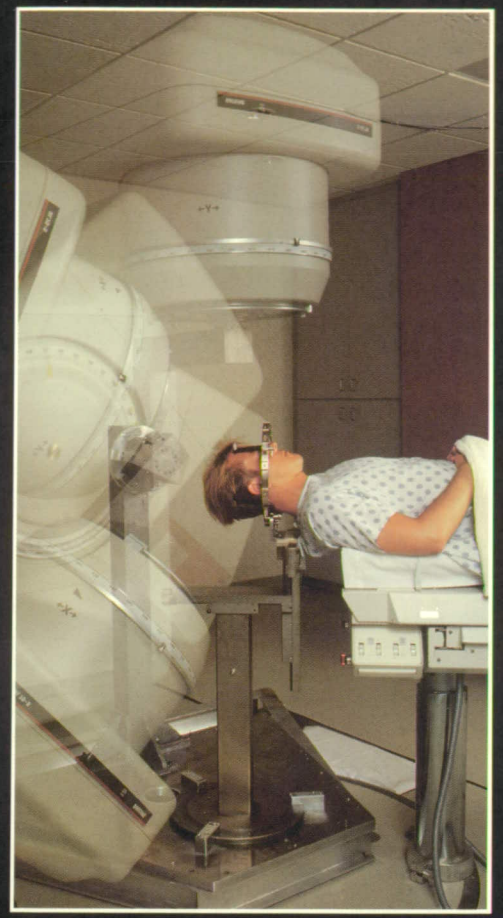
"This testing usually requires a hospital stay of at least two weeks because we need to record both seizure activity and response to the electrocortical stimulation," says Gilmore. "We want the patient to have seizures so we can localize the site in the brain where the seizures are originating. But during the electrocortical stimulation we don't want the patient to have seizures because then we won't know if change in function is related to the seizure or the stimulation.

"So we have to continually change the patient's medication to either precipitate seizures or try to prevent them. This can be a very frustrating time for both the patient and staff."

Once the team has localized the area of the brain where the seizures occur and is confident that the patient won't be left with any substantial neurological deficits if the area is removed, UF neurosurgeons surgically remove the grid and then perform a resection.*

As is the case in any invasive procedure, the risk of infection and bleeding are the primary causes for concern. The morbidity with the procedure is around three percent and is usually caused by infection.

**About 80% of patients will become seizure-free or have a significant reduction in seizure occurrence. While many remain on anti-seizure medicines, they can take reduced dosages, which greatly improves thinking and memory in some patients, Gilmore said.*



UF-DEVELOPED LINAC SCALPEL HELPS PHYSICIANS LOCATE AND TREAT DEEP-SEATED BRAIN DISORDERS

by Kim Rose

Physicians at the Shands Neurological Center at UF now can more accurately locate and treat deep-seated brain disorders with the recently developed LINAC scalpel method of non-surgical stereotactic radiosurgery.

UF neurosurgery professor William Friedman, M.D., and radiation physicist Frank Bova, Ph.D., developed the linear accelerator system to eliminate small tumors, blood vessel malformations and disorders deep within the brain with single-dose, high-level, external radiation. Physicians can aim fast electron beams at a heavy alloy target, producing X-ray films which then are collimated and focused on a stereotactically-identified intracranial target.

Such radiosurgery usually is used on patients with otherwise untreatable disorders. Surgery is performed on an outpatient basis. The patient is given a local anesthetic, undergoes CT scans and MRI localizations and is fitted with a metal headband to hold the head still and allow the physician to more accurately focus the beams on the exact location of the lesion. The procedure takes less than 30 minutes and surrounding tissue is left unaffected.

The FDA approved the LINAC scalpel for use in September, 1991, and UF has licensed the British firm Philips Medical Systems to market the $500,000 device. Five American medical centers and one German hospital have already begun to use the LINAC scalpel.

Psychiatrists and neurosurgeons work together to detect and treat psychological problems caused by hidden brain diseases

Psychiatrists often encounter patients whose psychiatric illnesses point to underlying brain abnormalities. They therefore must work closely with neurosurgeons to detect brain disorders so treatment such as LINAC therapy can be used to eliminate the problem's source and associated symptoms.

"Virtually every psychiatric syndrome there is can be mimicked by brain disease," said UF associate professor of psychiatry Jonathan Stewart, M.D. "We're very thorough in exploring for the possibility of covert brain disease in any first-break patient."

For example, Stewart, who is interim medical director of the Adult and Adolescent Inpatient Psychiatry Unit at Shands Hospital, said he will look for evidence of organic brain impairment in a patient with schizophrenic symptoms, especially if the patient is above the average age for schizophrenia to develop (16-24 years old). He will perform a neural imaging study to rule out the existence of a brain tumor, and he will give the patient an EEG to rule out covert seizure disorder.

Many brain diseases cause psychiatric symptoms, he said, such as Parkinson's, Alzheimer's, Wilson's, seizure disorders, Binswanger's and other dementias.

"These are hard to detect when the patient exhibits behavioral, psychiatric or even psychotic symptoms early on," said Stewart.

Two-thirds of patients with Parkinson's disease suffer serious depressions which are clearly not related to the disability caused by the disease. When you treat the disability with medication like Sinemet, said Stewart, the depression remains.

"It does, however, respond to anti-depressants," he said. "These depressive symptoms correlate with a decrease in 5HIAA, a metabolite of the neurochemical serotonin."

Overt brain diseases such as dementias cause psychiatric problems, but patients with very mild, sub-clinical dementias may not develop psychopathology until later on in life. When a diagnosable dementia finally develops, Stewart said, it may be the patient's only manifestation of a brain tumor. This underscores the importance of a thorough examination, he said, and residents are taught to suspect a covert neurologic illness when presented with a patient whose symptoms do not fall into the standard pattern of an illness.

A number of illnesses also mimic anxiety or depression.

"For example, certain malignancies are associated with depression, but many patients will develop a depressive picture even before they're aware they have cancer," he said.

"In a way, it's fortuitous because it sort of gives us a window into what's going on in the brain of people with endogenous or primary psychiatric illness. When we find out the underlying brain disorder, it leads investigators a

little closer to those parts of the brain which affect behavior."

Stereotactic surgery already has been used to treat one psychiatric patient at Shands Hospital, which is the only institution in this region performing this procedure. In April, a man with refractory obsessive/compulsive disorder received an anterior cingulotomy. Neurosurgery professor William Friedman, M.D., performed the surgery after the patient gained limited benefit from behavioral therapy and medication.

Assistant professor of psychiatry Alan Waldman, M.D., said that what triggers the disorder is unknown.

"Nobody knows what causes the imbalance of serotonin in the brain, which may result in obsessive/compulsive disorder symptoms," said Waldman.

"The response rate for a cingulotomy is approximately 50 percent. Our patient has shown continual improvement," he said. "The full benefit of the procedure may not be known for up to two years."

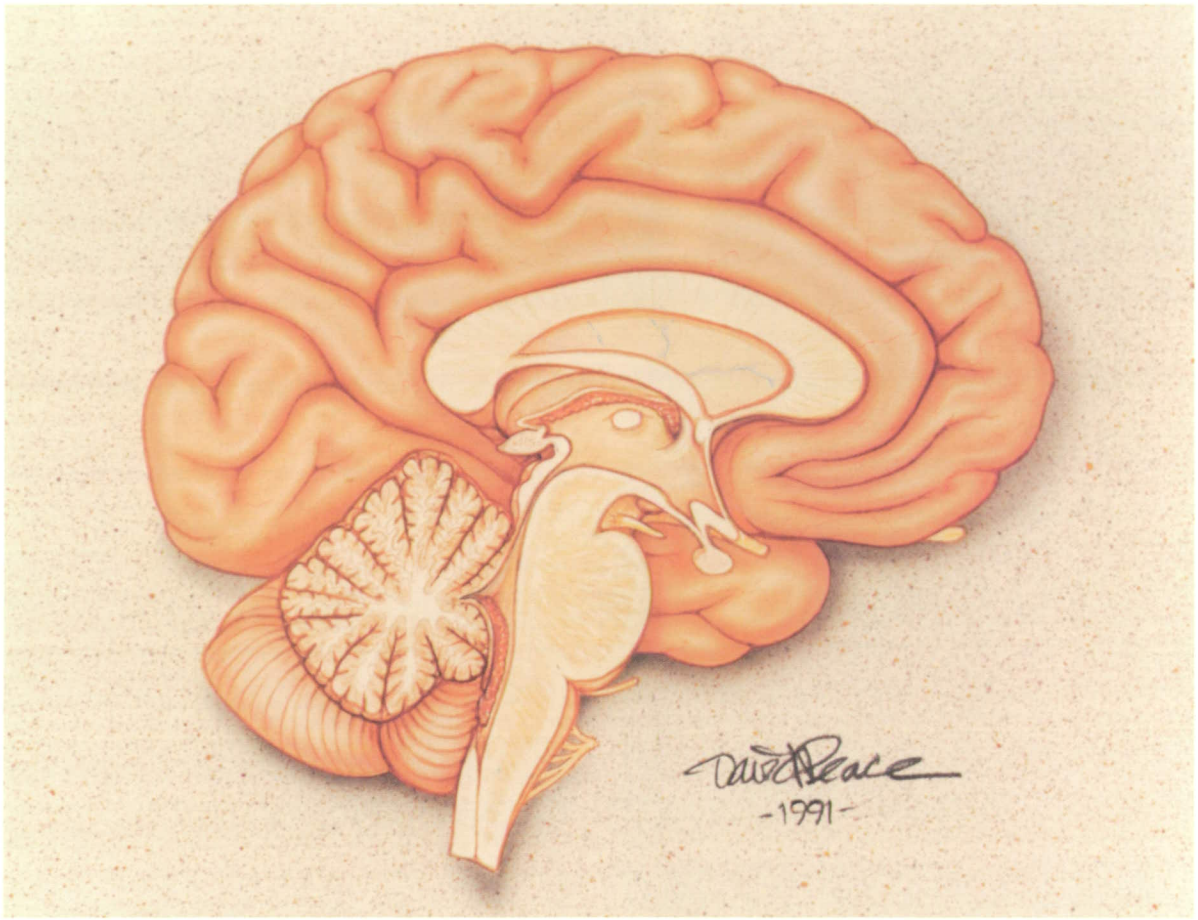
Other conditions which cause psychiatric symptoms requiring brain analysis include temporal lobe epilepsy, auto-immune diseases, deliriums, dementias and HIV infection.

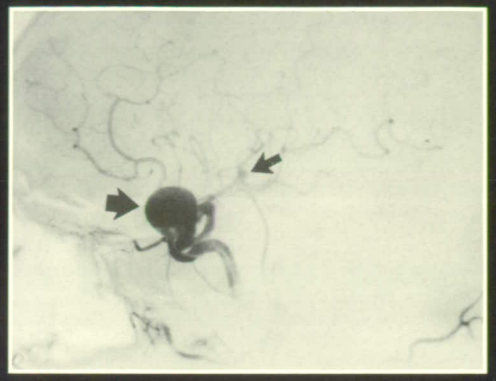
With TLE, symptoms may include delusions, illusions and hallucinations. These symptoms may be indistinguishable from schizophrenia symptoms and easy to misdiagnose, said Waldman.

Additionally, when a patient has the HIV virus, he or she may experience significant mental status change. Patients may undergo mood changes and cognitive change before they become sero-positive, before an MRI test reveals damage caused by the virus or before the onset of AIDS.

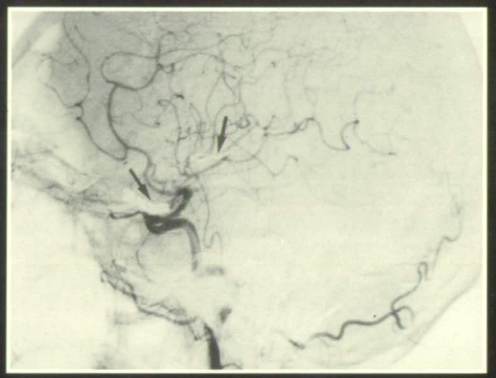
"The connection between psychiatric disorders and HIV is something we'll need to learn more about," said Waldman. "This includes better defining treatment modalities (e.g. anti-depressants) and preventative measures (e.g. Fidovudine)."

A $3.2 million grant awarded to new Department of Psychiatry chairman Dwight L. Evans, M.D., by the National Institutes of Health will strengthen the department's research into the neuropsychiatric and psychoimmune aspects of HIV infection.





Right carotid arteriograms in the same patient. *(Top)* Large saccular aneurysm at the ophthalmic-internal carotid junction (Large arrow) and smaller peripheral middle cerebral saccular aneurysm (small arrow). *(Bottom)* Post-operative clipping (arrows), with preservation of the parent vessels.



INCREASED UNDERSTANDING OF THE BRAIN'S ANATOMY LEADS TO SUCCESSFUL TREATMENT OF BRAIN ANEURYSMS

by Patrick Dyson

Some intracranial aneurysms, once considered untreatable by direct clipping because of their difficult-to-reach location, are now being treated successfully in more than 90 percent of cases, thanks to better maps of brain anatomy developed at the University of Florida.

Arthur Day M.D., an Eminent Scholar in the Department of Neurosurgery at UF's College of Medicine, reports an "outstanding rate of safety and success" in diagnosing and surgically treating more than 100 patients with aneurysms of the ophthalmic segment of the carotid artery. The patients have been treated at Shands Hospital over the past ten years.

Details of Day's refined microsurgical techniques were described as the cover story in the May 1990 issue of the Journal of Neurosurgery. The ophthalmic segment is named for its location near the ophthalmic artery, the branch of the carotid artery that supplies blood to the eye. Aneurysms in this location are frequently giant in size (> 2.5 cm.), partially calcified and thrombosed and compress the visual system. Their proximal point of origin is frequently imbedded in the skull base, making safe surgical exposure difficult.

Day fills the James and Newton Eblen Eminent Scholar Chair in Neurosurgery. He is president-elect of the Congress of Neurological Surgeons (CNS), and past-chairman of the joint section of cerebrovascular surgery for the CNS and the American Association of Neurological Surgeons. He is one of more than 120 faculty members involved in the formation of a new Brain Institute at UF.

"Ophthalmic segment aneurysms arise from a weak spot in the arterial wall near a bifurcation point," Day says. "The pulsation of the blood against this site causes a bulge which eventually becomes aneurysmal. These lesions aren't present at birth, but tend to develop."

As the aneurysm enlarges, it frequently presses against the optic nerve, causing loss of parts of the visual field and eventual blindness. In other cases, the aneurysm ruptures, causing subarachnoid hemor rhage. For unknown reasons, ophthalmic segment aneurysms occur almost exculsively in women, and in nearly half of cases will be multiple.

"Patients who experience loss of vision due to these aneurysms are often in their 50s by the time symptoms appear, and they often think their glasses simply need to be changed," Day said. "In the past, the real cause of the problem often went undetected for some time. Now a physician is much more likely to order a CT or MRI scan. We're discovering that ophthalmic segment aneurysms are more common than we thought, and we're turning up more of them in their early stages before obvious symptoms occur."

Although aneurysms can occur at many points on the carotid artery, those on the ophthalmic segment traditionally have been considered among the most difficult and risky to treat.

To reach an ophthalmic segment aneurysm, the surgeon makes an opening in the fronto-temporal area and removes a deep section of the sphenoid ridge and anterior clinoid process to an extent traditionally considered risky because of proximity to the cavernous sinus and its various nerves controlling vision, ocular motility and facial sensation.

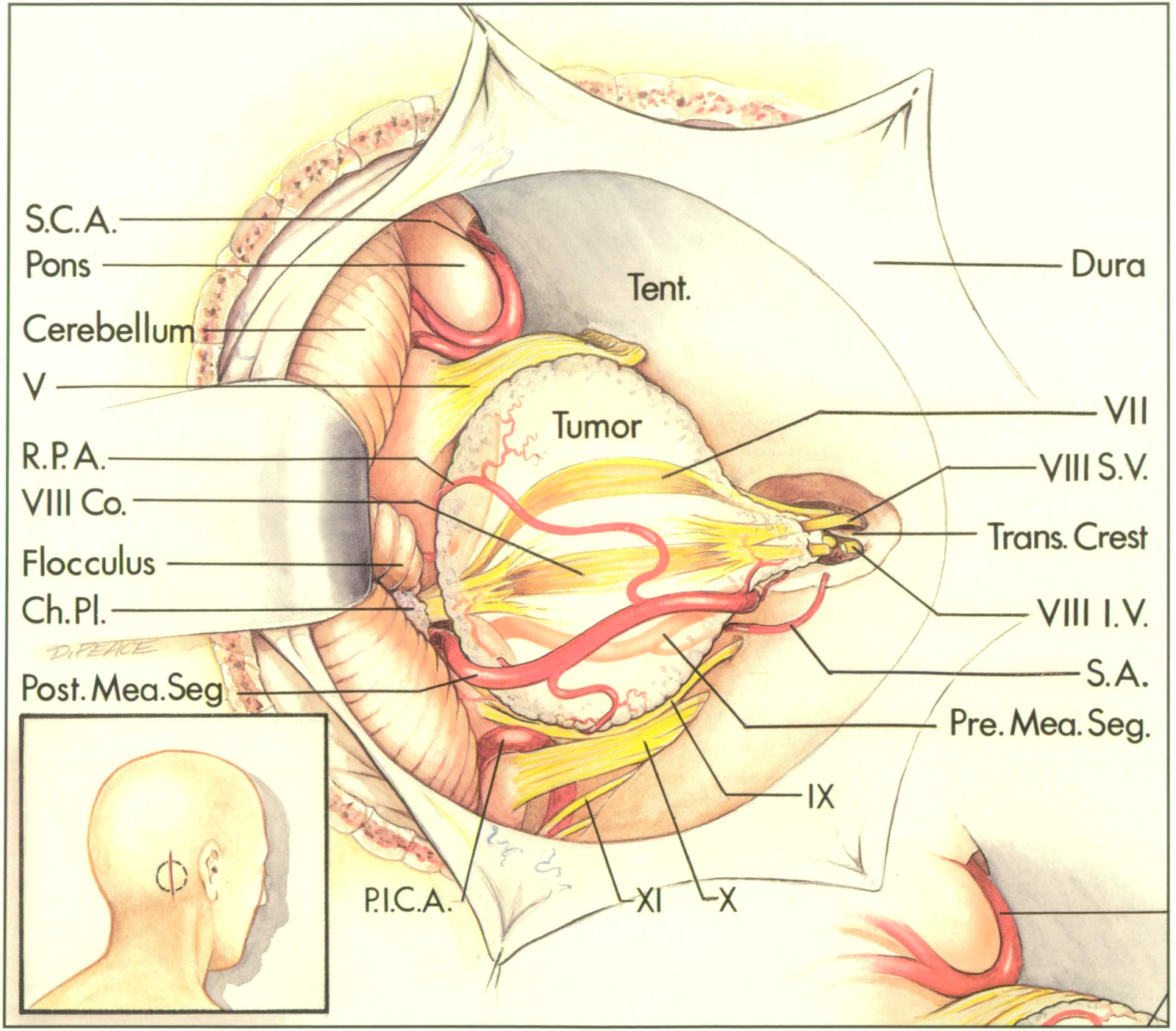
After exposure of the carotid artery within the skull base proximal to the aneurysm origin, the surgeon, working through a surgical microscope for an enlarged view, locates and closes the neck of the aneurysm with a miniature stainless steel clip which is left in place permanently. The aneurysm is then punctured and drained.

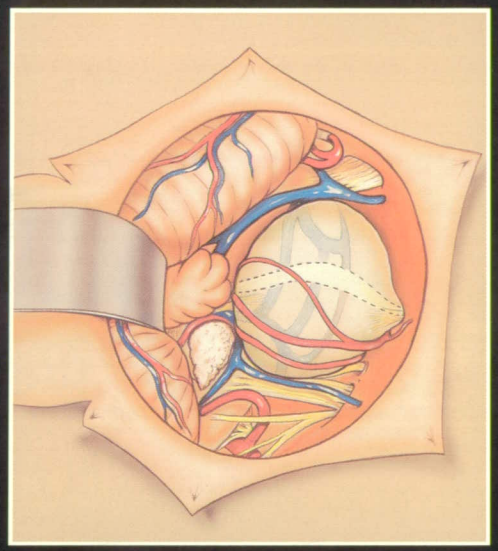
Day credits much of his success in safely reaching and treating ophthalmic segment aneurysms to the detailed studies of the brain's anatomy undertaken by Albert Rhoton Jr., M.D., the R.D. Keene Family Professor and chairman of the department of neurosurgery at the UF College of Medicine. Rhoton and his colleagues, including two medical illustrators, have spent countless hours creating the most detailed "maps" ever drafted of the brain and its intricate blood vessel network. This information helps neurosurgeons identify anatomical landmarks in order to avoid damage to delicate brain structures.

As an example, the veins and arteries in one particular small region of the brain are detailed in a 70-page paper containing 100 illustrations. In contrast, "Gray's Anatomy," the standard textbook of the human body, devotes a single sentence to describing the same area. Rhoton and his colleagues are remapping the entire brain section-by-section in a project supported by a million-dollar endowment from the Keene family of Orlando.

Right

One of many detailed "maps" of the brain and its intricate network of blood vessels and nerves, developed by Dr. Albert Rhoton and his colleagues, helps neurosurgeons identify anatomical landmarks in order to avoid damage to nerves and other delicate brain structures. This illustration shows a right acoustic neuroma with surrounding arteries and nerves.





ADVANCES IN TREATMENT FOR ACOUSTIC NEUROMA IMPROVE ODDS OF PRESERVING HEARING AND FACIAL MOVEMENT FOLLOWING SURGERY

by Kimberley Jordan

Advances in microneurosurgery techniques, combined with the monitoring of facial and auditory nerves during surgical removal of acoustic neuromas, have improved dramatically the surgery survival rate and the odds of preserving hearing and facial movement, especially in patients with small tumors.

Albert L. Rhoton Jr., M.D., R.D. Keene Family Professor and Chairman of Neurosurgery, reports a greater than 95 percent success rate in preserving the facial nerve, and a 50 percent success rate in preserving the cochlear nerve, in patients with tumors < 2 cm in diameter. Even with large tumors surgeons are able to save the facial nerve in most cases.

"In the early days of neurosurgery, the mortality rate from surgical removal of acoustic neuromas was in the range of 30 percent; it was uncommon to preserve the facial nerve, and almost unheard of to save the hearing in the involved ear," says Rhoton.

"Today, more than 99 percent of patients survive surgery. The advent of microsurgery in the 1960s allowed the surgeon to work at the limits of his human dexterity. The development of magnetic resonance imaging, which allows for detection of tumors as small as 3 mm in diameter, combined with the ability to monitor both the acoustic and facial nerves while the operation is in progress, have greatly reduced the risks of surgery and the residual neurological deficits."

Rhoton said the activity of the cochlear nerve is monitored during surgery using brain stem auditory evoked potentials, if these are intact prior to surgery. The facial nerve is monitored using electrodes placed in the facial muscles prior to the operation.

These electrodes detect the response of the facial nerve to electrical and even mechanical stimulation. Exploration of the tumor capsule with a fine electrical nerve stimulator often locates a thinned facial nerve before it is visible under the operating microscope.

Acoustic neuromas, which constitute about six percent of primary brain tumors, are benign tumors arising from supporting cells surrounding the eighth cranial nerve. They usually occur in the internal auditory meatus and initially present with deafness, tinnitus, loss of balance and pain in the affected ear. As the tumor enlarges, it can compress the brain stem and cerebellum, causing ataxia; the fifth cranial nerve, causing facial pain; or the sixth cranial nerve, causing double vision.

Of three surgical approaches to acoustic neuromas — the retrosignoid, the middle fossa, and the translabyrinthine approaches — Rhoton says he most often uses the retrosigmoid approach, conducted directly behind the sigmoid sinus on the back of the temporal bone, for removing both small and large tumors whenever there is the possibility of saving hearing in the involved ear.

Although other methods of treatment for acoustic neuroma are gaining greater use, a National Institutes of Health consensus panel announced in December after three days of consideration that conventional surgery is the standard recommended therapy. One member of the panel, which consisted of a dozen medical experts and a patient who suffered from the disorder, called surgery "the gold standard of therapy".

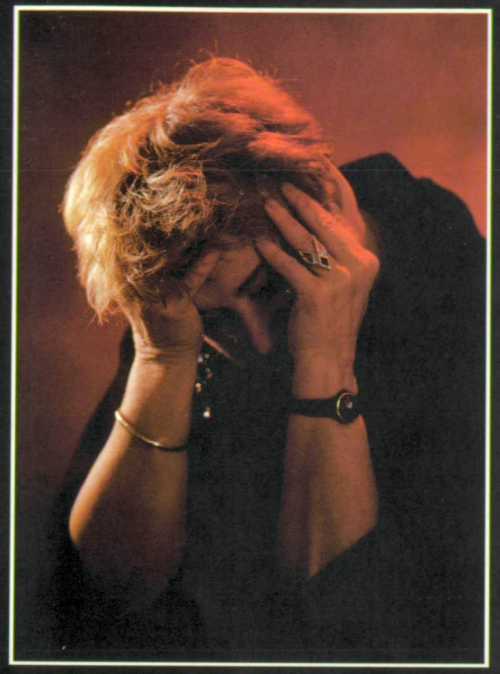
"There is considerable discussion today about the best surgical treatment to use when removing an acoustic neuroma," Rhoton said. "Many patients ask if the tumor can be removed with a laser, thinking if the laser is shined on the head, the laser beam will get inside and remove the tumor without having to open the scalp and skull.

"They don't realize that to use the laser, the scalp and skull still have to be opened as is done with any of the three conventional surgical methods. The difficulty with using the laser is that heat may spread to and damage the adjacent delicate nerves."

Rhoton said both the laser and the ultrasonic aspirator can be used to remove the core of a large tumor but not for the delicate removal of the tumor shell from the brain and nerve surfaces. "The final remnants of the tumor must be removed under the magnified vision provided by the operating microscope, using fine dissecting instruments. It is this final dissection that determines whether the nerves will be saved."

Stereotactic radiosurgery also is used to treat acoustic neuromas, particularly in patients who cannot withstand or refuse to undergo conventional surgery. Although most tumors treated in this way do not completely disappear, they usually shrink and often remain dormant throughout the lifetime of the patient, although there is a chance the tumor will continue to grow.

"Radiosurgery has proven most valuable in patients who are elderly, have significant medical problems which increase the risk of an operation, or have large tumors," Rhoton said. "The risk of loss of hearing and facial paralysis with radiosurgery is approximately the same as with microsurgery."



UF PHYSICIANS STUDY LINK BETWEEN DEGENERATIVE DEMENTIA AND DEPRESSION IN PATIENTS WITH ALZHEIMER'S DISEASE

by J. Michael Lenninger

University of Florida physicians at the Memory Disorder Clinic are investigating a suspected link between depression and dementia in the elderly.The researchers are enrolling at least 20 ambulatory patients from the University of Florida's Shands Clinic and the Veteran's Affairs Medical Center in a study of the correlation between neurochemical transmitters in the brain and depression in dementia.

"Is depression a normal psychological reaction to having dementia, or is it the result of a chemical change caused by the Alzheimer's disease process in the brain?" asks principal investigator Jonathan Stewart, M.D., who is director of the geropsychiatry inpatient service in Shands Hospital at the University of Florida and chief of inpatient psychiatry services at Gainesville's VAMC.

If depression is the result of a biological process, then treatment modalities may be different, and in fact, possibly more effective, says Stewart, who is also an associate professor of psychiatry at UF's College of Medicine.

In the study, researchers will measure patients' cognitive functions and conduct a lumbar puncture to collect cerebrospinal fluid to measure the presence of various metabolites and enzymes. They also will administer two standardized scales to evaluate the level of depression in patients with Alzheimer's disease.

The researchers hope to determine if depression associated with Alzheimer's disease is caused by patients reacting to the illness or if an inherent chemical imbalance of the nervous system causes the depression.

"As many as 30 percent of patients with Alzheimer's disease also may have depression, which is treatable," says Stewart.

"Depression is an important cause of morbidity in demented patients that can lead to further decline in their ability to care for themselves. Depression can cause a lot of misery and suffering for the patient, as well as for the family. While you can't treat degenerative dementia, you can treat the associated depression and behavioral problems," he says.

Stewart believes that as many as 90 percent of elderly patients with depression are not being diagnosed during a visit to a physician.

"It's important to maintain a high index of suspicion for depression in any elderly patient, especially in people who have the risk factors for depression," says Stewart.

"The tricky thing about detecting depression in the elderly is that they don't manifest the same symptoms as younger people."

Depressed patients ordinarily manifest three types of symptoms:

- **Mood symptoms** — *sadness, crying spells and feeling blue*
- **Cognitive symptoms** — *pessimism, guilt, hopelessness, assuming the worst, inability to enjoy oneself and one's favorite activities*
- **Vegetative symptoms** — *disturbances in appetite, sleep, energy and sexual drive*

"It's common to see elderly patients with depression but without associated mood symptoms," Stewart says. "Look for cognitive symptoms. Depressed people often look depressed. Ask your patients if they tend to think about the past in a negative way, if they tend to see no hope in the future and if they have a hard time enjoying previously enjoyed activities," he says.

Recent widowhood, lack of social supports, multiple or disabling medical illnesses, and the threat of being placed in a nursing home are significant risk factors for depression.

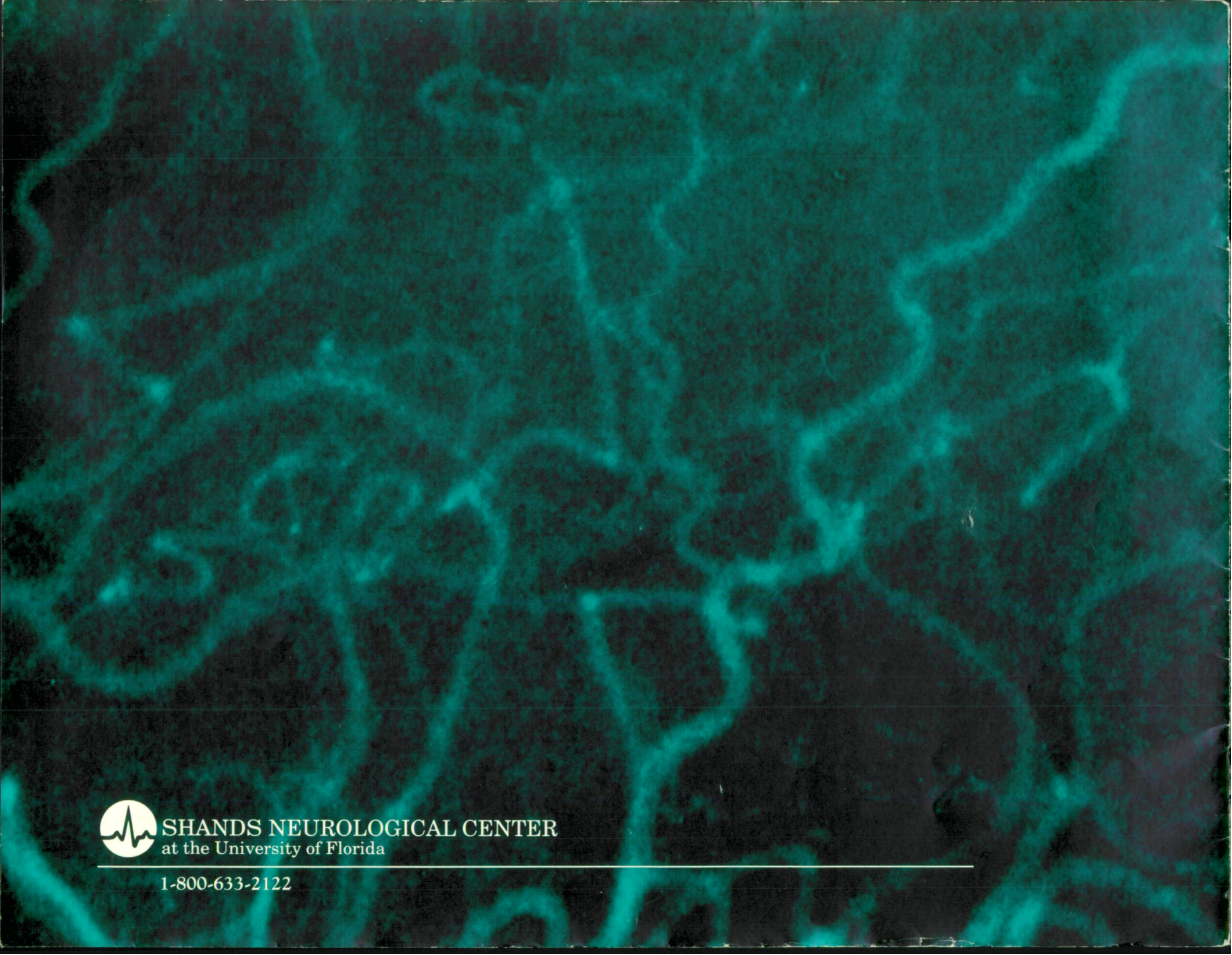
Many of the signs of depression also can be signs of dementia, and it takes a trained clinician to recognize the difference. For example, lack of personal hygiene or a cluttered environment can signal depression in an individual, but also dementia.

Treatment for depression can consist of drug therapy, psychotherapy, family therapy, referral to an adult psychiatric outpatient facility or admission to a geropsychiatry inpatient unit. Patients with dementia and associated depression usually respond well to antidepressant medication, but Stewart stresses the importance of an adequate diagnosis.

"In the Memory Disorder Clinic, we have a chance to use a multi-disciplinary team to formulate a diagnosis and help patients and their families," Stewart said.

About 10 percent of the population above the age of 65 can have dementia, and perhaps 25 percent of the population older than 85 has some form of dementia.

Clinical care, teaching and research in Alzheimer's disease is being targeted as a major area of growth for the Department of Psychiatry by new department chairman Dwight L. Evans, M.D., who is also professor of medicine and neuroscience in the UF College of Medicine.



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