McCormick named distinguished faculty member

J. Justin McCormick, associate dean for research and co-director of the Carcinogenesis Laboratory, has been named an MSU Distinguished Faculty Member.

McCormick said the award held special meaning for him because he was selected to receive this award from among his colleagues.

"It's a vote of approval by people who know something of the work you're doing," McCormick said.

McCormick is recognized nationally and internationally for his work in the molecular biology of cancer causation and development. His research using gene transfer techniques has recently culminated by showing how normal human fibroblasts can be transformed into malignant cells, an achievement with significant implications for future research.

McCormick said healthy cells are transformed into cancer cells through a series of changes he likens to a "Chinese menu model."

According to this model, a cell must undergo gene changes in at least five categories in order to become a malignant cancer cell. McCormick said the difficulty for researchers trying to understand the process of human cell transformation (carcinogenesis) is identifying the specific genes involved.

"We know some of the genes that have to be changed," McCormick said. But he said there were about 100,000 possible genes. By taking pieces of DNA isolated from malignant cancer cells and introducing them into non-malignant cells more can be learned about the nature of the genes involved and the process of transformation.

McCormick said it will be possible to use the model being developed with cells in the Carcinogenesis Laboratory as a template for understanding the disease in

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AIDS Education Project looks at past and future

The AIDS Education Project, now entering its third year of a three-year contract, is at a crossroads in its development.

"We are right now looking at what we had set out to do, what we have accomplished and what we want to do in our last year," said David Bannow, project manager.

Bannow said the project may request a continuation of the funding it has received for a second three years. The project is funded by the National Institute of Mental Health. Additional support has been received from the Michigan Department of Mental Health.

The AIDS Education Project is involved in developing a system of education for Michigan health care providers and students concerning the mental health and psychosocial aspects of the disease.

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Teaching computers how to think

Richard Hallgren, associate professor of biomechanics, is looking at how special computers modeled after the human nervous system can "learn" to recognize patterns by mimicking the functions of the human brain.

Computers can be intimidating, taking only a fraction of a second to complete complex mathematical operations; but ask them to race you to recognize a face and you'll win every time.

Richard Hallgren, associate professor of biomechanics and radiology, is looking at how special computers modeled after the human nervous system can "learn" to perform tasks related to perception and recognition.

For example, human faces have many common characteristics: two eyes, two ears, a nose and a mouth. Yet it is very simple for the human brain to differentiate between faces, even faces that are similar.

"If you try to use a computer to recognize a face, some of the variations are so subtle that it's difficult to generate a program to separate one face from another," Hallgren said.

He said part of the trouble computers have with non-computational tasks is that they have no data built up from trial-and-error experiences.

"The classical computer really does not have a background of acquired knowledge it can use to make decisions," Hallgren said. "The human builds up a library of learned responses."

In contrast to conventional computers, neurocomputers are trained to perform tasks by repeatedly being presented with a representative example of input data along with the desired response. The computer automatically adjusts its internal programming parameters to develop a procedure to achieve the desired response.

"In essence, a neurocomputer, mimicking the human nervous system at a low level, learns how to make correct decisions by a trial and error process," Hallgren said.

By understanding how the neurocomputer goes through the process of learning, Hallgren hopes to find ways to make neurocomputers more efficient learners.

"The neurocomputer works best when it's modeled like the human computer, and it has a tremendous amount of redundancy," Hallgren said. "The problem with a lot of redundancy is that computation gets very long."

Hallgren said that a neurocomputer will always find a solution to a problem presented to it, but the solution won't always be the best solution. As the neurocomputer progresses through its training process, it follows a path along an error surface, a mathematical projection of the difference between the actual and the desired output. The shape of the error surface is determined by the set of input parameters, the internal structure of the computer network, and the desired response. The problem is that it's not always clear to the neurocomputer what the right answer may be. There may be what Hallgren calls "local minimums" in the error surface, places where

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How diet can affect the growth of human breast cancer, and how the immune system can be stimulated to fight cancer are the subject of two related studies being conducted by Professor Clifford Welsch of the Department of Pharmacology and Toxicology.

Welsch discussed his research with members of the Michigan Chapter of the Ladies Auxiliary of the Veterans of Foreign Wars recently. The organization donated $32,360 toward Welsch's breast cancer research program. The funds represent a portion of the organization's 1988-89 cancer aid and research drive.

Four past officers from 1988-89 presented the donation. They were State President Audrey Dillin, State Treasurer Diana Cospar, State Cancer Chairperson Jenny Hobson and State Cancer Pin Chairperson Sylvia Richardson.

Welsch said an earlier study in his laboratory showed that different types of dietary fat affect the growth of human breast cancers differently.

Welsch uses as a model human breast cancers transplanted and maintained in specially-bred immune-deficient mice, called athymic nude mice.

When these mice are fed diets high in certain vegetable oils, such as corn oil, breast cancer growth is at its highest, while those fed diets high in fish oil show no increase in breast cancer growth. Diets that are high in animal fats, such as butter or beef tallow, cause a moderate increase in breast cancer growth.

"The question is how does one explain this difference," Welsch said. "We think that the very slow breast cancer growth in the fish-oil fed mice might be due to the accumulation in the cancer of cytostatic and cytolytic lipid peroxides."

Welsch said the fish oil diet may generate increased production of these lipid peroxides, a type of oxygenated fatty acid. These peroxides, however, may not be entirely beneficial.

"They can accumulate in many normal cells as well and cause cellular damage," he said.

The other question Welsch hopes to answer is why the effect of dietary animal fat on the growth of human breast cancer differs from that of vegetable fat. He said the answer to that question is not yet known, although a number of possibilities do exist.

Welsch is also looking at how to stimulate activity in the immune system to slow or prevent breast cancer growth. By inducing the activity and production of a special type of lymphocyte, called natural killer lymphocytes (NK cells), Welsch hopes to determine if these are the key immune system cells in combatting cancer.

"We hope to isolate these cells, increase their number and utilize them for therapy," Welsch said. He said he was directing his attention toward a special sub-group of the NK cells, called lymphokine activated killer cells (LAK cells), which he believes are the most important type of lymphocyte in slowing cancer growth.

"We believe that in patients that have cancer

Clifford Welsch, professor of pharmacology and toxicology, is studying the effect of dietary fat on breast cancer and the body's natural defenses against the disease.

continued on page 5
AIDS Education

continued from page 1

Professor of psychiatry and project director Terry Stein said the project has found physicians need to learn how to deal with the psychological and social aspects of AIDS.

"There is still a reaction against both groups of people which have on medicaid.

Bannow pointed out health care workers need to be aware and be sensitive to the diversity of cultural groups.

"Different cultures have different beliefs as far as how sex should be discussed and talked about, and about death," he said. "If you're going to ef-

April Conner, project coordinator, said the project's multi-cultural advisory committee helps address those problems.

"The purpose of the committee is to get advice from a variety of groups affected by AIDS that are often underserved," she said.

Conner said the committee is currently considering a project to organize and conduct a training symposium on cultural diversity, sexuality and HIV infection.

"It's difficult to contact communities and talk about HIV infection because it involves talking quite graphically and specifically about sexuality and homosexuality," Conner said. She said the program would be aimed primarily at health care workers and social workers "in the front lines," who deal with AIDS on a day-to-day basis.

"Several studies have shown even doctors are not comfortable talking about sexuality," Stein said. He said the project was preparing several research proposals for teaching the skills necessary for taking sexual histories and inquiring about risk factors.

Another problem is a growing perception that the AIDS crisis is over. Recently released figures show the disease is not increasing at the rate expected.

The Centers for Disease Control estimate that 179,000 to 208,000 new cases will be reported between now and the end of 1992.

higher rates of HIV (Human Immunodeficiency Virus) infection and against patients with the disease," he said.

Stein said people who work with AIDS patients are often uncomfortable with the issues of death and dying, fear of infection and sexuality. In addition, doctors may be reluctant to treat AIDS patients from underprivileged groups who don't have access to private insurance and must rely effective in your intervention you need to be sensitive to these diversities."

Bannow said it was important to avoid offending people and turning them away from medical care.

"In order to have them feel comfortable and trust the medical establishment you need to be concerned about these sensitivities," he said.

"Until we had to deal with AIDS there hasn't been a need for physicians to be overly sensitive in these areas."
"There does seem to be some leveling off in the increase in the number of cases," Stein said, but he noted that it can be attributed to early intervention with drugs like AZT before HIV infection becomes full-blown AIDS.

For every one AIDS case diagnosed, it is estimated there are ten cases of HIV infection with or without symptoms.

"This is the time we don't want to let up on the message," Bannow said. He said it was important to make sure people didn't return to risky behavior.

Conner said the project is offering programs and training in the community and in the medical schools. Every first-year class receives training through the project. In addition, programs are available throughout the year.

One very important part of the project is the AIDS Resource Library. The library makes available to the public a wide variety subjects related to AIDS. Bannow, who is the library coordinator, said that the majority of items are aimed at a professional audience, but the public is able to use it as well. The library includes journal articles, bibliographies, pamphlets and videotapes.

Stein said several possible directions the project may take after this year include becoming more committed to bringing AIDS material into the curriculum, working more directly with physicians, and researching the skills needed in the taking of sexual history and getting adequate information to assess AIDS risk.

"The project is going to be around, but we're not sure what form it will be in," said Stein.

Breast cancer continued from page 3

there are effective cancer-killing cells. These cells need to be identified, isolated, stimulated to grow and become more active and then reintroduced into the patient," Welsch said.

The hope is that there are naturally occurring immune system cells that may someday be used in place of current chemotherapeutic agents. Welsch noted that many chemotherapeutic drugs currently in use to fight cancer have detrimental side effects.

"Thirty or 40 years from now we may look back at these cytotoxic chemotherapeutic drugs and think we have been pretty barbaric," Welsch said. "Nevertheless, many of these drugs are the only tools the clinician has to slow or prevent the progression of cancer. At this point they are very important."

The studies will take advantage of the unusual characteristics of the athymic nude mouse, a laboratory animal bred with a limited immune system. The mouse can accept grafts of some human tissues, including cancer tumors. Welsch said that was very important.

After a presentation to the members of the Auxiliary, Welsch took them on a tour of some of the laboratories being used in his research. Welsch said he would give a presentation in the future to the group and let them know how his research was progressing.
Botsford Hospital's Powell looks to future changes

Vance Powell, director of medical education at Botsford General Hospital, sees the internship as a unique and important part of an osteopathic physician's training.

"I firmly believe that going through [internship] in the first postgraduate year in some form makes you a better-rounded physician and gives you a better appreciation of the whole patient," Powell said.

Currently, osteopathic physicians are required to take a one-year rotating internship which offers exposure to the major disciplines of medicine. He said that as an OB/GYN physician, he finds it useful to know how to examine a patient in ways not directly related to his specialty.

Powell said internships were especially important in primary care.

"I don't have to refer everyone who comes in with some complaint or problem and send them hither and yon," Powell said.

Despite his support for the concept of internships, Powell said new technology makes further postgraduate education more important than ever.

"I don't think just to do an internship itself and then go into practice is a practical thing anymore," he said. Powell noted that 11 states already required some form of further postgraduate study for licensing, and others are considering similar moves.

"I think that's a trend you'll see more of," he said.

Powell said whether or not to consolidate internships into residency programs would be a concern in the future of graduate medical education. He said it was important to see education as a continuum, from medical school through postgraduate programs.

"OB/GYN, internal medicine and pediatrics are the only specialties so far to develop curriculum to include that and still have the basic core as part of the first year," he said.

Another concern is ambulatory care. Powell said programs need to be developed taking into account the exodus from the hospitals of patients

Powell believes DMEs are becoming more and more sophisticated. He believes that eventually physicians will opt to train specifically for the role of DME.

"One of my goals as president-elect [of the Michigan Academy of Osteopathic Directors of Medical Education] is to develop a training program for people to become career medical administrators," he said.

not needing high levels of care.

"If you really want to project it out," Powell said, "it wouldn't be too difficult to imagine that in ten years the hospital will become an intensive care unit."

Powell said hospitals will have to use a network of clinics to provide students with an opportunity to learn about the continuity of health care.

Powell said medical students today have a greater number of choices open to them in postgraduate education than were available in the past. That has led to changes in programs.

"I think students are being more selective now in what they want," he said. "There are more opportunities available, so they can afford to be."

He noted that allopathic postgraduate programs were able to attract osteopathic physicians away from osteopathic programs because of a perceived quality difference. Powell said alternative internship tracks and reviews of existing programs enable osteopathic programs to be more competitive in quality.

"It comes down to the fact that an intern wants a quality education," Powell said. "Their attitude is that they want to be taught."

A survey of 1988 graduating osteopathic interns undertaken by the Academy of Osteopathic Directors of Medical Education showed 77 percent were entering primary care residency training in allopathic institutions.

Despite this figure, Powell said "I think there is a great loyalty to the profession. I'm sure of that now, because of the surveys I've done and the people I've talked to."

Powell said that past funding differences allowed allopathic programs to pay interns better than osteopathic programs. He said salaries were about $5,000 to $6,000 more per year in allopathic programs.

"I think to a person $80,000 in debt and not making any money, that's a lot of money. It's really relatively not, but at that point it seems like it is," Powell said.

Although debt may influence a person's choice in postgraduate education, Powell doesn't think the question of money is dissuading people from pursuing medicine.

"I don't think there are that many people who sit down and decide
they're not going to be a doctor because it's too expensive," Powell said. "If you really want to be a physician you can find a way to do it."

The average debt of osteopathic students last year was $64,700. A recent report released by the American Association of Colleges of Osteopathic Medicine said 32 percent of first-year students say they expect to owe more than $80,000 at graduation.

Powell sees his role in the education process as a facilitator in the maturing of physicians. By teaching the practical aspects of medicine to students, Powell says he helps round out the education of physicians.

"These are my future colleagues," he said.

Powell sees himself as a liaison between doctors and hospital administration. He continues to practice medicine along with his role as DME, a fact which he says gives him a perspective on both roles.

"I can see both sides of the story," he said.

Powell said he believes DMEs are becoming more and more sophisticated in order to develop programs that meet the changing needs of medicine. He said DMEs have become more and more dedicated since he first became one. He believes eventually physicians will opt to train specifically for the role of DME.

"One of my goals as president-elect [of the Michigan Academy of Osteopathic Directors of Medical Education] is to develop a training program for people to become career medical administrators," Powell said.

As for his future, Powell sees himself continuing as both an administrator and a physician.

"I like what I'm doing here," he said. "I can't imagine myself slowing down."

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**Study shows enrollment increase**

A study released by the American Association of Colleges of Osteopathic Medicine showed a five percent increase in first year enrollments in 1988. There were 2.3 applicants per available medical school space, a figure which remains constant from last year.

AACOM's 1989 Annual Statistical Report provides data on applicants and enrollments in colleges of osteopathic medicine. It showed 1,780 freshmen students in 1988. Total enrollment in colleges of osteopathic medicine was 6,614. The report predicts enrollment will remain stable for the next few years.

Women made up 32 percent of total first-year enrollment, the highest percentage to date. The report stated 9.8 percent of first-year students were members of minority groups such as Blacks, Hispanics and Native Americans, up from 6.2 percent last year.

The report says debts incurred continue to escalate. The average debt of osteopathic students last year was $64,700. Thirty-two percent of first-year students say they expect to owe more than $80,000 at graduation.

A report issued by AACOM last year said that more than half of graduating seniors in 1988 reported that economic need influenced their choice of specialty.

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![Osteopathic Medical School Enrollment](attachment:image.png)

*Osteopathic Medical School Enrollment for 1988*

- **White/Non-Hispanic**: 62.5%
- **Black**: 4.6%
- **Hispanic**: 4.6%
- **Asian/Pacific**: 7.7%
- **Native American**: 0.4%

*Source: AACOM*
**COM student first D.O. in fellowship program**

Beverly Roberts-Atwater, COM '92, has been awarded one of five 1990 William T. Grant fellowships distributed nationwide. Roberts is the first student from an osteopathic college to be awarded the fellowship. Roberts-Atwater said the honor comes with a sense of responsibility. The program has always been open to both D.O.'s and M.D.'s, but as the first D.O. student named a Grant fellow, she said she will be seen as an example of the kind of student osteopathic schools produce.

"Everybody who congratulates me says 'you know they'll be watching you,'" she said.

The 1990 William T. Grant fellows represent five medical schools and include four Black women and one Hispanic woman. Each fellow receives $3,500.

The fellowship program was created to encourage research and career interest in the area of stress and coping among school age children. Each fellow will spend an academic quarter at the Johns Hopkins University School of Hygiene and Public Health, under the auspices of a faculty member of the department of Mental Hygiene and the Prevention Research Center, a program sponsored by Johns Hopkins in partnership with the Baltimore City Public School system. The Prevention Research Center aims to promote mental health, self esteem and a variety of social and academic goals for children.

Seminars developed specifically for the fellows by their Hopkins preceptors will provide background in community epidemiology, measurement, field trials and health and behavioral problems of children. Fellows will join research work groups, conduct literature reviews and participate in thinking through analytic issues involved in measurement, paying special attention to reliability and validity. Fellows will also take part in discussions about the problems of statistical design.

Roberts-Atwater is looking forward to the experience, for which she will postpone her base hospital work three months in 1991. Although she doesn't yet know the details of the the research project she will be working on, Roberts-Atwater said the work with school age children fits in well with her interests.

Roberts said she was also interested in relating medical research to practice. She said clinicians sometimes view research as dealing with numbers, not people. She said it is important to make research useful to practice.

"A lot of [research] gets too generalized," she said.

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**Student’s dance stems from studies**

Incorporating the experience of medical school into interests outside medicine can enrich both pursuits. Just ask second-year COM student Roberto Corales.

Corales recently choreographed a piece for the MSU Dance Repertory theatre which dealt with the subject of childhood abuse. The piece, entitled "Not Quite Right," stemmed from his reaction to a lecture by Shirley Johnson, professor of family medicine. Corales said the piece was a reaction to the realization that abuse was not always detected by persons outside the dysfunctional home.

"It tells of the subtleness of child abuse, because it is not so evident," Corales said. "What these families have is a facade in public; but home is where the turmoil is."

The 10-minute piece is a modern ballet. It begins with section using fluid movements from three dancers and soft music, which is interrupted by a section of louder, rhythmic music and tumultuous action on stage. Later the dancers return to the synchronized, fluid movements of the beginning.

Corales said his use of a specific theme is not unusual in dance. "In ballet there’s always a story line," he said. "Most dance has some kind of meaning behind it; the choreographer always has something in mind."

Corales has been dancing since his freshman year as an undergraduate at Eastern Michigan University. He participated in the Eastern Michigan Dance company for seven years. In 1985 he was one of two people from Michigan to teach at the French Woods Academy for Performing Arts in New York.

Corales said it was difficult for him to balance his interest in dance with his studies.

"It's very, very hard. At this time dance has to be second to my academics," Corales said. He noted that after his piece was performed in January he resigned from the MSU Dance Repertory theatre to concentrate on his studies and the Undergraduate American Academy of Osteopathy, of which he is president.

Corales said he has received a lot of positive feedback on his piece from faculty and students. He said he will continue with dance as he becomes a physician.

"You’re not going to be a physician 24 hours a day," he said. "Some part of my life will be devoted to dance."
Alumni News

Wally Ghurabi, COM ’76, has been elected vice chief of staff at Santa Monica Hospital Medical Center in Santa Monica, Calif. Ghurabi has been a staff physician at the 367-bed medical center since 1980. He currently serves as medical director of the hospital’s Nethercutt Emergency Center and chairman of its Family Practice department. Ghurabi resides in West Torrance, Calif., with his wife, Hilda, and their four children. Ghurabi is board-certified in emergency medicine and a fellow of the American College of Emergency Physicians.

Anthony Dekker, COM ’78, was featured in the January issue of The D.O. for his work with Chicago’s Healthcare for the Homeless. Dekker, who specializes in adolescent medicine, has been providing medical services for homeless persons at Chicago shelters for seven years.

James L. Gross, COM ’81, wrote to say that after completing his residency in family practice at Bon Secours Hospital in Grosse Pointe in 1985 he relocated to Arizona. He and his wife Lou-Ann live in Scottsdale. Gross works in the emergency department of St. Luke’s Hospital in Phoenix. He is board certified by the American Board of Family Practice and the American Board of Emergency Medicine. He adds: “Since moving to Arizona I have been active in Big Brothers/Big Sisters of Arizona and I have also made approximately 20 trips to Mexico with Liga, which is a group which utilizes volunteer American physicians to staff Red Cross clinics in rural Mexico.”

Ruben Tenorio, COM ’82, and his wife Gail announce the birth of their second child, Carissa Lauren, Jan. 13. Carissa joins her brother Bradley, age six.

Douglas Hinzman, COM ’83, completed his residency in plastic-reconstructive surgery in Des Moines, Iowa and a fellowship in aesthetic surgery in Rancho Mirage, Calif. While in training, he published five papers on various reconstructive and aesthetic subjects. He will be practicing at the Plastic Surgery Center in Lansing.

Thomas A. Naegele, COM ’83, will be presenting papers on “Practice Guidelines Research” and “The Hub Computer Medical System” at the Sixth International Conference on Computerization of Medical Records, held March 14 to 17 in Kansas City. The event is usually attended by more than 1,000 people from around the world.

Mary Closser, COM ’84, has completed a psychiatry residency at the University of Michigan and a two-year clinical research fellowship in substance abuse. She will be accepting an assistant professorship at the Yale School of Medicine in July.

Faculty News

Department of Family Medicine chairperson Barbara Ross-Lee has been awarded the Robert Wood Johnson Health Policy Fellowship. The program, initiated in 1973, is intended to extend the public policy horizons of health professional schools and improve the capabilities of faculty members to study health policy and assume leadership roles in health activities.

Fellows are outstanding mid-career professionals working in academic health settings. They are chosen from nominations by academic health centers and other U.S. institutions with medical schools.

The program is funded by the Robert Wood Johnson Foundation and conducted by the Institute of Medicine of the National Academy of Sciences with assistance from the American Political Science Association. Six fellows participate each year in a one-year program of orientation and full-time working experience in the nation’s capital.

Harold Bowman (Pathology) has been reappointed as chairman of the Professional Education Committee on Professors of Clinical Oncology of the American Cancer Society. Bowman was also appointed to the Residency Review committee for Dermatopathology, continued on next page

Do you have news for Communique? Have new faculty members joined your department? Have you published a paper, given a presentation, received an award? Do you have news of interest to your former classmates? Let us know!
sponsored by the Medical Education Committee of the American Medical Association. The committee is composed of equal numbers of pathologists and dermatologists.

Celebrate Health events planned

Healthy U's annual Celebrate Health event is scheduled for Thursday through Saturday, April 5-7. The three-day focus on fun and health is designed to involve the entire campus community and to help provide a basis for a continuing Healthy U network.

Healthy U will sponsor exhibits and demonstrations at the International Center, this year’s central site, and in the Wells Hall Lobby area on April 5 and 6 from 11 a.m. to 1:30 p.m. On April 6, award ceremonies for Healthy U award winners will be held in the Con Con Room at the International Center at 11:30 a.m. and a Fun Walk/Run will be held at 12:10 along the river behind the center.

On World Health Day, Saturday, April 7, the International Health Council Student organization will sponsor speakers and collect food for the Greater Lansing Food Bank from 10 a.m. to 3 p.m. at the World Health Day observance.

A complete list of Celebrate Health Events will be published on March 29 in the MSU News Bulletin. For more information, contact Healthy U at (517) 353-2596.

Healthy U cited by state for health promotion

Healthy U was also recently selected by the Michigan Department of Public Health as one of the leading wellness programs in the state. Healthy U won first place in the business and industry category of MDPH’s annual Director’s Award competition. The competition honors programs outside of public health departments that best influence the health of Michigan citizens.

The award cited Healthy U "for its wide variety of activities in the development of people involved programs, information presentations and curriculum courses dealing with those areas most affected by lifestyle: stress, substance abuse, safety, nutrition and physical fitness."

DOH sponsors coronary artery disease symposium

Detroit Osteopathic/Bi-County Community Hospitals are sponsoring a one-day symposium, the second annual "Management of Coronary Artery Disease." The program will be held at Bi-County Community Hospital in Warren on Sunday, March 25 from 8 a.m. to 12 noon. Cost is $30 for non DOHC physicians, $20 for DOHC physicians and free to physicians in training. For more information, contact Lori Mosseau, Co-ordinator--Continuing Medical Education, at (313) 252-4823.

Neurocomputers

similarities between wrong answers and right answers are high.

"The problem is that on the error surface, when it runs into one of these local minimums, it trape itself like a ball rolling down to a low spot," Hallgren said.

As the computer begins to move out of these "troughs" the error increases, which tells the program it's making the wrong decision. One of the questions Hallgren is looking at is how to get the program to recognize when it is in a local minimum as opposed to a global minimum, where the error is as low as it may be.

Hallgren hopes to use his work to help develop programs for identifying specific structures from data, such as angiographies from magnetic resonance images or left ventricle blood pool analysis.

Hallgren is working with relatively simple error surfaces currently. He hopes that by understanding these simple problems, he will be able to explain how more complex problems may be solved. That will make it easier for programmers to develop applications for neurocomputers.

Hallgren hopes to incorporate his work into image analysis programs in a little over a year.
Continuing Medical Education

March 28-April 1
Tutorial on Direct Action Thrust Manipulative Technique

A five-day intensive course in the principles and use of direct action high velocity manipulative therapy. Primary emphasis will be placed upon the spine, pelvis, and thoracic cage. The course will consist of lectures, demonstrations, and small group practice sessions. Emphasis will be placed upon diagnosis and the appropriate prescription of manipulative therapy. Faculty include Philip Greenman, D.O., F.A.A.O., chairperson; Alan Abromovitz, M.D.; Frank George, D.O.; and John Bourdillon, F.R.C.S. Prerequisite training in Principles of Manual Medicine and Level I Muscle Energy Technique is required. Limited enrollment. Co-sponsored by MSU-COM and the College of Human Medicine. 40 hours Category I credit. Cost is $1,000; $500 for physicians in training.

April 20-22
Differential Diagnosis of Low Back Pain: an Interdisciplinary Approach

The course objectives are to present an integrated patient assessment as a basis for differential diagnosis, to emphasize diagnostic procedures to assist in differential diagnosis, to emphasize interrelationship of visceral and somatic etiologies of low back pain and to use case histories as models for the problem solving process in patient management. Faculty include chairperson Philip Greenman, D.O., F.A.A.O., manual medicine; Mitchell Elkins, D.O., neurology; Richard Pascucci, D.O., rheumatology; Lawrence Myśliwiec, D.O., orthopedic surgery; and David Neff, D.O., general medicine. 20 hours Category I credit. Sponsored by MSU-COM. Cost is $600; $300 to physicians in training.

April 27-29
Tutorial on Level I Myofascial Release Technique

Intensive exposure to basic concepts of myofascial release manipulative therapy. Emphasis is placed on direct experiences giving participants opportunity to test various forms of motion and motion changes, and palpate various tissues and forms. Faculty includes Robert Ward, D.O., F.A.A.O., chairperson. Prerequisite training in Principles of Manual Medicine is required. Limited enrollment. 24 hours Category I credit. Co-sponsored by MSU-COM and the College of Human Medicine. Cost is $600; $300 to physicians in training.

May 7-12
Motor Regulation in Back Problems

This course will emphasize the diagnosis and treatment of muscle imbalance in disturbances of the motor (musculoskeletal) system. The importance of proprioceptive balance and training will be highlighted. Muscle evaluation of length, strength and firing patterns will be presented. Faculty includes Vladimir Janda, M.D., D.Sc., professor and head of the Department of Rehabilitative Medicine, University Hospital, Prague, Czechoslovakia. Enrollment by invitation only. Cost is $500. 24 hours Category II credit. Held at the Holiday Inn University Place, East Lansing.

May 10-11
Neurobehavioral Rehabilitation of the Brain Injured Child and Adult

This two-day seminar is designed to acquaint participants with the conceptual foundations of the Michigan State University/Brain Injury Rehabilitation Program. The goal is to provide familiarity with the philosophy, structure and clinical application of the innovative neurorehabilitation program based on the cognitive perceptual motor approach, presently in operation at the MSU Rehabilitation Medicine Clinic. This introductory seminar is open to all those interested in gaining a better understanding of the problems of brain-injured individuals and their rehabilitation. This may include physicians, rehabilitation personnel, physical therapists, occupational therapists, social workers, and family members.

For more information or to register for any of the courses, contact the Office of Continuing Medical Education, MSU-COM, A306 E. Fee Hall, East Lansing, MI 48824-1316, or call (517) 353-9714.

Unless otherwise noted, all courses are held at the MSU Kellogg Center for Continuing Education on Harrison Road in East Lansing.

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Calendar

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May 21-23
Tutorial on Level I Functional Indirect Technique

A three-day intensive tutorial in the diagnostic and therapeutic application of functional (indirect) technique. This system uses the principles of motion testing for "ease and bind"; inherent tissue motion; and motion away from the resistant barrier and is applied to the vertebral axis, rib cage and extremities. Faculty include Edward G. Stiles, D.O., F.A.A.O., chairperson; and Harriet Shaw, D.O. Prerequisites are Principles of Manual Medicine, Level I Muscle Energy; Level I Craniosacral Technique; Level I Myofascial Release (recommended). 24 hours Category I credit. Sponsored by MSU-COM and the College of Human Medicine. Cost is $600; $300 to physicians in training.

June 9-13
Tutorial on Level II Manual Medicine Techniques (Below Diaphragm)

This course is designed to review and expand previous training in manual medicine. This includes supervised practice of the hands on skill of palpatory diagnosis and manipulative treatment; discussion of anatomical and/or physiological characteristics which increase the capability of dealing with complex problems, often of traumatic origin; consideration of the connective tissues; an expanded list of illustrative and manipulative procedures. This course has a limited enrollment due to the heavy clinical orientation. Edward G. Stiles, D.O., F.A.A.O., chairperson. Prerequisites are Principles of Manual Medicine, Level I Muscle Energy and Direct Action Thrust. 40 hours Category I credit. Sponsored by MSU-COM and the College of Human Medicine. Cost is $1,200; $600 to physicians in training.

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