New biomechanics lab at the cutting edge

A single step while walking actually consists of many complex motions and forces. Dissecting those and other complex motions is what the new Biomechanics Evaluation Lab (BEL) at St. Lawrence Hospital is all about.

"We're trying to understand the functions of the musculoskeletal system," said Robert Soutas-Little, Biomechanics chairperson and lab director.

The lab officially opened at St. Lawrence Nov. 30.

The lab uses high-speed video cameras and computer technology to look at motion in minuscule segments of time. The lab is one of only a few facilities in the nation at its level of sophistication.

Supported by MSU-COM, St. Lawrence Hospital and Brook's Shoe Company, the lab is temporarily housed in a unique location—the old chapel of St. Lawrence Hospital. Soutas-Little said the chapel, which had been scheduled for demolition, was prepared in three weeks to house the lab, a feat which required around-the-clock work.

The lab uses three different kinds of technology to evaluate motion. Video cameras record motion visually, a pressure-plate set in the floor measures the forces generated and electromyography (EMG) records which muscles are used.

The video component of the lab consists of four high-speed pixel-perfect video cameras shuttered at one-one thousandth of a second. By measuring the distance from each of the cameras to reflective discs and computing where those discs appear in the video picture, it is possible to calculate the location of all points inside a specific area to within one millimeter. When a subject wearing reflective targets moves through the calculated space, the targets are identified by the computer and matched up to the previously calculated point each is nearest to. This occurs sixty times each second.

"Obviously you could never do that without computers," Soutas-Little said.

The resulting data can be called up on the computer screen in a three-dimensional model and run again and again, allowing a physician to watch for anomalies in a patient's motion.

"Pathology just yells at you," said Patricia Soutas-Little, co-director of the lab from St. Lawrence.

The pressure plate measures the forces generated.

continued on page 4

A new series looks at graduate medical education

The education of osteopathic physicians doesn't end at graduation from medical school. Graduate medical education begins with the first rotating internship, and continues throughout a physician's life, with residency training, continuing medical education and informal learning.

Communique begins a series this month looking at graduate medical education at the Michigan hospitals associated with MSU-COM. We will be featuring the programs and the people who help graduates bridge the crucial gap between graduation and practice.

This month's article, beginning on page 3, looks at Flint Osteopathic Hospital.

In this issue:

GME at Flint Osteopathic Hospital .......................... 2
CME annual report ........................................... 3
Newsbriefs ...................................................... 5
Continuing Medical Education ............................. 7
At Flint Osteopathic Hospital, preparing physicians for the changing face of medicine means changing the face of medical education as well.

Christopher Meyer, vice president of medical education at FOH, said more government intervention and the "businessization" of medicine has made it necessary to train students in different settings.

"For the last 80 years or so medical education has been hospital oriented," Meyer said. "Now we recognize that in the future we need to get more and more of our training done in an out-patient ambulatory setting."

Meyer said it is necessary to take advantage of settings that have not been fully utilized in the past, such as public health clinics, substance abuse programs and wellness programs, to educate physicians.

Dennis DeSimone, FOH director of medical education, said he sees changes within the hospital.

"We've had some positive changes along the line of getting more clinicians involved," DeSimone said.

DeSimone said one of the changes is paying program directors for their involvement.

"It may not be a large salary, but it is something," he said.

DeSimone said other aspects of FOH's program were unique.

"We have a unique situation here at FOH because we have a clinical coordinator clerkship program," he said.

The program places a coordinator responsible for monitoring the progress of students in each of the major areas of medicine. The clinical coordinator then makes sure the training program goes well for the students. The program helps students adapt more quickly to the hospital environment.

Changing the face of graduate medical education is also reflected in FOH's commitment to COGMET. "I think COGMET is a way for us to improve the quality of osteopathic graduate medical education in Michigan," Meyer said. "[It's] a step in the right direction."

"They have a person they can go to as a chief, so if they get into any problems academically or clinically they have someone who will act as a liaison for them," DeSimone said.

"That improves the educational experience because the clinical coordinators are more interested in how the students are doing," DeSimone said. "It also encourages better feedback."

Changing the face of graduate medical education is also reflected in FOH's commitment to COGMET, the Graduate Medical Education at FOH is the responsibility of Christopher Meyer, vice president of medical education.

Consortium for Osteopathic Graduate Medical Education and Training. Meyer is chairperson of the COGMET board of directors and the director of COGMET-Internal Medicine.

"I think COGMET is a way for us to improve the quality of osteopathic graduate medical education in Michigan. It represents a consortium which includes the 11 major D.O. hospitals in the state," Meyer said. "That's a step in the right direction."

Meyer said that in the past the college had been responsible for undergraduate medical education and the hospitals were responsible for
graduate education. There wasn't much interaction among the hospitals and the college.

COGMET seeks to create a consortium with the goal of improving the quality of osteopathic graduate medical education in the state and making the programs more credible with students in order to alleviate the exodus of D.O.s to allopathic programs.

Meyer said COGMET will provide a better, more organized structure for graduate medical education, allowing people to meet and share ideas.

"If the structure is better we'll have a certain payoff in better programs," he said.

Meyer noted that hospitals and the university offer different things to each other. Hospitals have more than 1,000 clinical faculty and 100,000 annual patient admissions. They have a long history of individually strong training programs. MSU-COM has research facilities and faculty in the basic sciences, as well as full time staff able to evaluate programs.

Both DeSimone and Meyer gain satisfaction from their roles as educators.

"To me it's the most gratifying part of my career," Meyer said. "It's exciting to me to look at educational programs that don't work or haven't met their objectives in the past and find a way to make it better."

"As a physician I can treat one patient at a time," Meyer said. "As an educator I can influence hundreds of D.O. physicians."

"The rewards for me come from watching students develop and grow," DeSimone said. "That's where the fun is."

DeSimone said he feels it is important for him to get out of the office and do his teaching out in the hospital.

"It keeps you in touch with what's going on with the students," he said.

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CME reports successful year

MSU-COM’s Office of Continuing Medical Education recently reported another successful year of offering high quality programs to health professionals.

Participants numbering 2,157 participants from all over the United States, Canada and the world attended 187 programs. Seventeen courses were offered in manual medicine, attracting 400 registrants. Credits provided in manual medicine totaled 572. Credits overall totaled 920.50. Twenty-seven extramural courses were offered last year, an average of one every two weeks. The majority of the courses, 63 percent, were held at MSU’s Kellogg Center. The remainder were evenly divided between off-campus and out-of-state courses. MSU-COM offered 160 intramural courses.

Continuing medical education courses have increased 44 percent over the last three years.
when the foot comes into contact with the ground. It measures six different types of force 1,000 times per second. When a person takes a step, the foot moves in three dimensions. The up-and-down motion of the foot about the axis of the ankle is called the dorsi-planter flex. Rotation of the foot around the vertical axis of the leg is called medial-lateral rotation. Finally, if the foot is turned in toward the body on its own axis it is said to be inverted; if out, everted.

Measuring these forces creates a "fingerprint" for the subject's step. Robert Soutas-Little said it was possible to tell a patient just by the graph of the pressure plate data.

In normal walking, when the foot first hits ground, the force generated is about 1 1/4 times body weight. As the body shifts forward and the knee bends, the force falls to about 25 percent less than body weight. This is because at that time the body is actually falling forward over the foot. When the foot "pushes off," the pressure goes up to about 1 1/4 body weight again. This generates what is known as an "M-curve," because of the M shape of a graph of the forces. In running, the forces can go as high as 2 1/2 to three times the body weight.

The third component of the lab is EMG. Modern miniaturization allows the BEL to use small transmitters that can be stuck on the patient's body. The transmitters, which are non-invasive, collect data on muscles or muscle groups which are being used in movement, and transmit those data to a sixteen-channel FM receiver.

The amount of information that is collected in experiments is staggering. Soutas-Little said the computer handles about 200,000 pieces of information per second in real time.

Soutas-Little said one of the unique aspects of the BEL was the non-invasive character of the techniques used. Other labs use older techniques that may involve cumbersome equipment being worn by the subject. Older forms of EMG even used needles inserted directly into the muscle tissue. Soutas-Little said such techniques can alter the data obtained.

"[Those kinds of techniques] so interfered with the experiment you were trying to conduct that the experiment was useless," he said.

Currently, Soutas-Little said the lab was being used primarily for research and teaching, although some clinical benefits are being gained. Some uses have included pre-surgical orthopedic evaluations and performance evaluations.

"If you say, was that a clinical trial or research, I can't tell," he said. "What we're dealing with is on the front edge of technology."
Faculty News

Terrie E. Taylor (Community Health Science) was the subject of an article in the November issue of *The D.O.* The article was about her work in Malawi and her research on the treatment of malaria.

Kathryn Lovell (Pathology) presented a paper entitled "Oligosaccharide Accumulation in Brain and Spinal Cord in Caprine Beta-mannosidosis" at the annual meeting of the Society for Neuroscience in Phoenix, Oct. 29 to Nov. 3. She also presented a paper entitled "In Vitro Characterization of Oligocerebrosides in Caprine Beta-mannosidosis" at the New York Academy of the Sciences Conference on Myelination and Dysmyelination in Alexandria, Va., Nov. 16 to 18.

Philip E. Greenman (Biomechanics) gave the Scott Memorial Lecture at the 1989 Founder's Day at KIrskville College of Osteopathic Medicine. Greenman spoke on "The Challenge of Change." Greenman was also a panelist at the Challenge of the Lumbar Spine '89 conference Perspectives on Pain, held in San Francisco Nov. 2 to 5. Greenman participated in three panels: "Differential Diagnosis of Low Back Pain," "Manual Medicine" and "Conservation Care," where he spoke on osteopathic care.

Richard Martocci, clinical professor of neurology, was recently named chairman of the Department of Internal Medicine at Pontiac Osteopathic Hospital.

Susan Hendrix (Osteopathic Medicine) and Barbara T. Sparks (Osteopathic Medicine) have received a grant through the College of Osteopathic Medicine. In collaboration with E. James Potchen (Radiology) they will determine the effectiveness of Magnetic Resonance Imaging (MRI) as a screening and/or diagnostic tool for endometriosis and pelvic adhesions. Additionally, they will compare the MRI with pelvic laparoscopy in the diagnosis of endometriosis and adhesions.

Barbara T. Sparks (Osteopathic Medicine) and Kassim Mahomed of the University of Zimbabwe have received a $25,000 grant from the Carnegie Corporation for an initial investigation of Pregnancy Related Hypertension in Zimbabwe and develop a comprehensive plan for further study. The plan will involve a multiphasic approach to the disease in selected rural communities, examining cultural practices in pregnancy, biochemical measures of hypertensive patients and clinical trials in rural areas.

Student News

Awards for Outstanding Presentations were given at the 1989 Biomedical Student Research Forum to Marianne Huben, COM '92 and David Pawst, COM '92. Both will receive a commemorative plaque and $100.

Olga Sanchez Salino, a senior medical student from Facultad De Medicina De Cadiz in Cadiz, Spain, is an exchange student at MSU-COM this term in a neurosurgery internship with neurosurgeon Clark J. Okulski in association with Detroit Osteopathic Hospital. Julie Johnson, COM '90, a director of MSU-COM's International Health Project, made the arrangements for the exchange through the International Federation of Medical Students Association, of which MSU-COM is a member. Exchanges of MSU-COM students with other foreign medical schools will be made through this same organization. Professor of osteopathic medicine and coordinator of international student health programs Walter C. Mill arranged for the enrollment and said that through our students' efforts a viable program is developing.

Alumni News

Timothy McKenna, COM '76, was honored as "Outstanding Clinical Instructor of the Year" for 1988-1989 by Ingham Medical Center's osteopathic interns. McKenna is the first recipient of the new award.

*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!*

*continued on next page*
Brent R. Allan, COM '82, writes to announce the dedication of the All Health Medical Center in memory of Lawrence D. Sills, COM '82. The All Health Medical Center is a $33,000 square foot medical facility in Scottsdale, Ariz., which is the new home of twenty multi-disciplinary, multi-specialty, and multi-professional medical practices. The facility was dedicated November 17 to Sills, who was killed in the 1987 Northwest Flight 255 plane crash in Detroit. It is dedicated to Sills for "the kindness he gave, the friendship and comfort he shared, and the love and laughter he brought into all of our lives."

James G. Ard, COM '84, completed his residency in family practice and was board certified by the American Board of Family Practice. He is now living in West Germany, where he serves in a full-service family practice clinic in the U.S. Army 67th Evacuation Hospital in Wargburg.

Peter C. Rink, COM '85, published a paper entitled "Functional Bracing in the Anterior Cruciate Deficient Knee, A Comparative Study" in the June 1988 issue of Orthopedic Review. The paper was also awarded first place in 1988 for sports medicine papers by the American Osteopathic Orthopedic Academy. Rink is in his final year of orthopedic surgery training at Detroit Osteopathic Hospital.

Jerome Smith, COM '85, and Marla Price, COM '84, have joined forces to open a general ophthalmology practice in Trenton, Mich. The practice opened July 1.

Jim Freeman, COM '86, announces the birth of his son Ian Fitzpatrick Freeman on Oct. 13. He also writes he has moved to Alpena to begin practice with a medium-sized primary care group.

Symposium on Health Care Issues of Black Americans

A symposium on health care issues facing black Americans will be held January 9 at the Kellogg Center for Continuing Education. The program will consist of didactic presentations and small task force discussions addressing AIDS, substance abuse and infant mortality as they affect the black community. A historical perspective on the contributions of blacks to the field of medicine will be included. The program is designed for physicians, nurses, medical students, administrators, social workers and other professionals responsible for health care delivery. The program is presented as part of the MSU IDEA commitment. Faculty include LaClaire G. Bouknight, M.D., of the Michigan Department of Social Services. Sponsored by the Office of the Vice Provost for Human Health Programs together with MSU-COM, the Black Faculty Association, the College of Human Medicine and the College of Nursing, the program has been approved for 7 hours Category II credit. For more information, contact the Office of the Vice Provost, Human Health Programs, A110 E. Fee, Michigan State University, East Lansing, Mich., 48824-1316, or call (517) 353-5366.

HHS Secretary's Award Competition

The deadline for papers for the 1990 HHS Secretary's Award Competition for innovations in Health Promotion and Disease Prevention is March 15, 1990. Students can compete for prizes of $3,000 for first place, $2,000 for second place, $1,000 for third place, and $250 for semifinalists. Proposals must not exceed 2,500 words and should describe health promotion projects, health protection programs or preventive risk-reduction efforts. Entries will be judged on innovation, feasibility and potential impact. Details on the program are available through COM Student Affairs office.

Correction

Peter S. Konchak was incorrectly identified as a clinical professor of osteopathic medicine in an item in the November issue of Communique. He is in fact an assistant professor in the department of osteopathic medicine, and was the principal author of the article "Stillbirth: Maternal and Fetal Evaluation" in the September issue of the Journal of the American Osteopathic Association. Communique regrets the error.
January 20-22
Principles of Manual Medicine
Part B

A combination of didactic lectures and "hands-on" experience sufficient to understand the principles involved in the diagnosis and treatment of musculoskeletal disorders amenable to manual medicine methods. Emphasis will be placed on the integration of manual medicine into total health care. Principles of Manual Medicine-Part A is the prerequisite for this course. Completion of Parts A and B fulfill the requirement of Principles of Manual Medicine for all other postgraduate manual medicine courses offered by Michigan State University. Chairperson is Philip E. Greenman, D.O. Co-sponsored by MSU-COM and MSU College of Human Medicine. Cost is $500 or $250 for physicians in training. 20 hours Category I credit. Registrations will be taken on a "first come, first served" basis. No phone registrations will be accepted. To be held at the Tucson Hilton East, Tucson, Ariz. Housing is the responsibility of the registrant.

January 24-28
Tutorial on Level I Craniosacral Technique

The course objectives are to understand the primary respiratory mechanism, to understand the interrelationship between the primary and secondary respiratory mechanisms, to apply palpatory skills to the craniosacral mechanics, to understand potential dysfunctions of the primary respiratory mechanism, to apply the principles of manipulative management to craniosacral dysfunction. This program is designed to provide ample opportunity for the "hands-on" experience. Thus, enrollment is limited to keep the faculty/student ratio low. Program Chairperson is Barbara Briner, D.O. Prerequisite is Principles of Manual Medicine. 40 hours Category I credit. Sponsored by MSU-COM. Cost is $1000, $600 to physicians in training. To be held at the Tucson Hilton East, Tucson, Ariz. Housing is the responsibility of the registrant.

March 8
4th Annual Family Medicine Conference
Topics and faculty to be determined. Sponsored by MSU-COM's Department of Family Medicine. To be held at MSU's Kellogg Center.

March 14-18
Tutorial on Level I Muscle Energy Technique

This course is designed to expand previous training in manual medicine in the area of use of muscle contraction as an activating force. Concepts of muscle contraction will be taught and will be utilized in the treatment of the vertebral column and the bony pelvis. The structural diagnostic system will be expanded in dysfunctions of the vertebral column and bony pelvis. Chairperson is Philip E. Greenman, D.O., F.A.A.O. Faculty includes John Bourdillon, F.R.C.S.; Mark Bookhout, M.S., P.T.; and Edward Isaacs, M.D. Prerequisite is Principles of Manual Medicine. 40 hours Category I credit. Sponsored by MSU-COM and the College of Human Medicine. Cost is $1000, $500 to physicians in training. To be held at the Tucson Hilton East, Tucson, Ariz. Housing is the responsibility of the registrant.

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., chairman; and John Bourdillon, F.R.C.S. Prerequisite training in Principles of Manual Medicine and Level I Muscle Energy Technique is required. Limited

continued on page 8
Calendar
continued from page 7
enrollment. Co-sponsored by MSU-COM and the College of Human Medicine. 40 hours category I credit. Cost is $1,000 or $500 for physicians in training.

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

Elkiss, D.O., neurology; Richard Pascucci, D.O., rheumatology; Lawrence Mysliwiec, D.O., orthopedic surgery; and David Neff, D.O., general medicine. 20 hours Category I credit. Sponsored by MSU-COM. Cost is $600 or $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 include 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 or $300 to physicians in training.

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 or $300 to physicians in training.

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