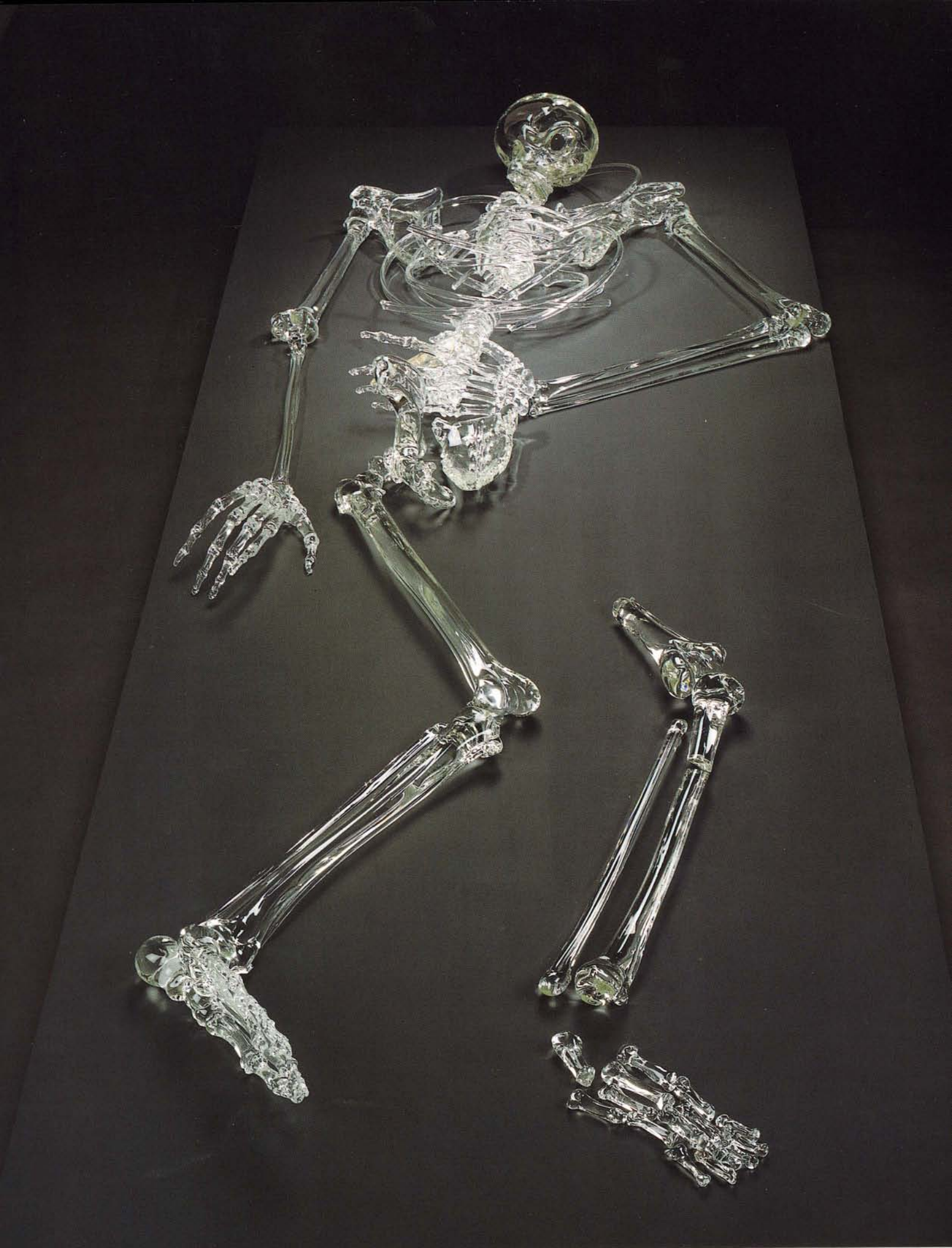
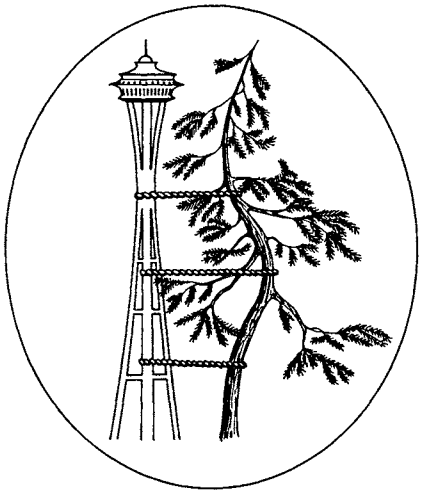
DEPARTMENT OF ORTHOPÆDICS

1965 — 1990



DEPARTMENT OF ORTHOPÆDICS

1965 — 1990



UNIVERSITY OF WASHINGTON

The publication of this 25th Anniversary history of the Department of Orthopædics was made possible through the generous support of the AO/ASIF Foundation and SYNTHES USA.

Editing: Sandy Marvinney
Design: Marquand Books, Inc.
Photography: Ed Kohnstamm

Front plate: "Artifact Series #3 (Hunter)" by William Morris, reprinted with permission.

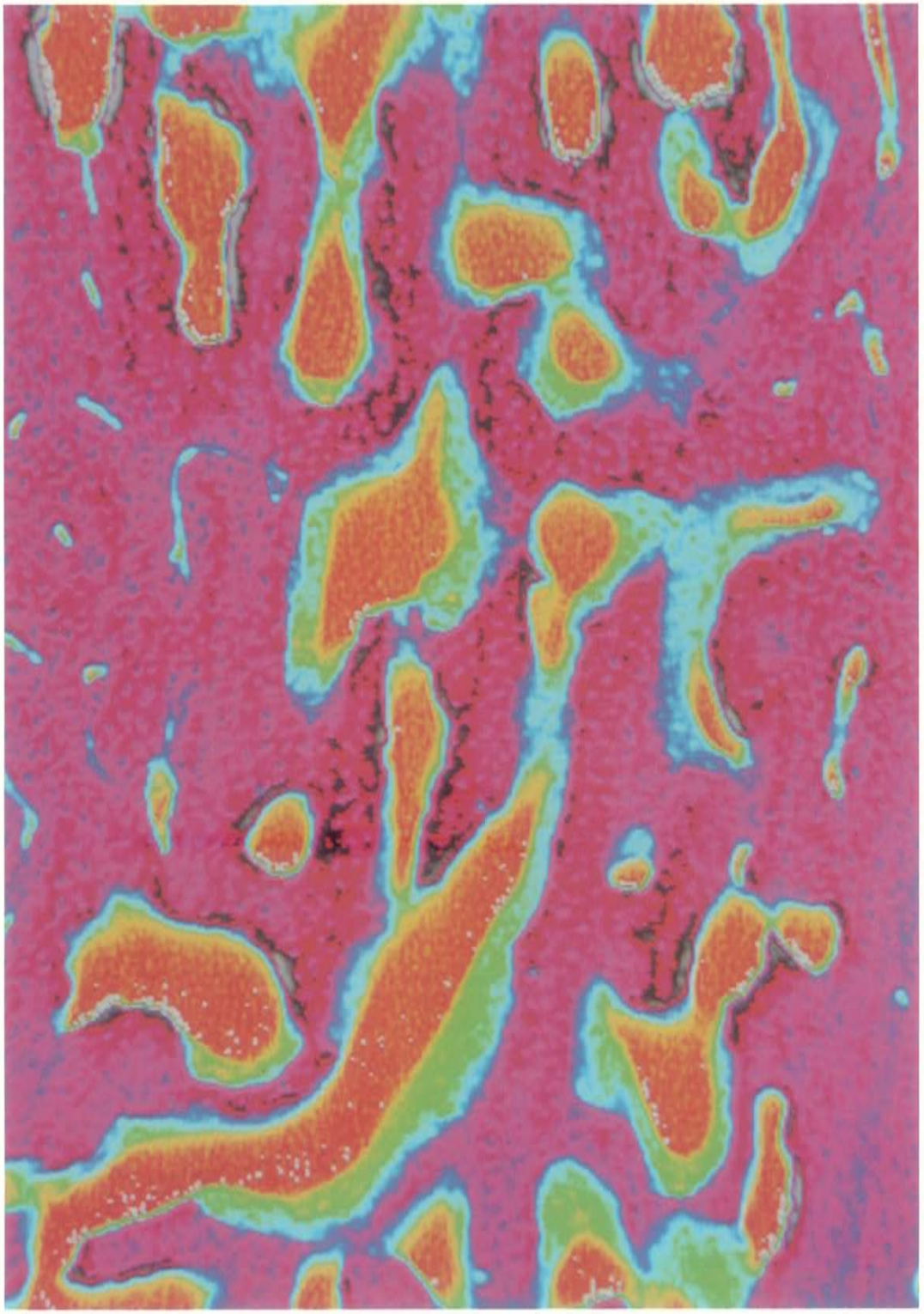
Plate at right: Computer enhanced photomicrograph of cortical bone by Prof. Dr. B. Rahn, Laboratory for Experimental Surgery, Davos, Switzerland.

Photo Credits: Special Collections Division, University of Washington Libraries—page 8, negative #94900; page 9, negative #UW2352 (Maynard), Curtis photo #18439; page 10, negative #94808A (COH), Todd photo #20005(a) (HMC).
Ed Kohnstamm—pages 16, 25, 27, 29, 31, 32–38, 46
Cynthia Taylor—page 38 (UWMC)

Department of Orthopædic Logo: "Just as the twig is bent, the tree's inclined." Orthopædic departments and associations worldwide have adopted logos based on the original design of a tree with bracing that appeared in the 1741 book *l'Orthopédie* by Nicholas Andry. In 1978 Dr. Allan Bach created a uniquely local version for the Department incorporating the Space Needle and a Douglas fir.

Department of Orthopædics
University of Washington
Seattle, Washington 98195

1990



Contents

"In many other centres when one got to work in the morning, there would be talk of some foreign crisis or political misadventure, whereas at the University Hospital the outdoors and the environment took precedent. The 'pros and cons' of the morning's sunrise with the possibility of a good snowfall always started the day off on a happy note."

Peter J. Bath

"The early 1980s were a time of very great change, and without knowing it, the Department was on the cutting edge of the practice of orthopædics—and we were never even located in New England."

Robert J. Foster

"I have been blessed with three orthopædic godfathers. I will always be deeply indebted and grateful for the association I have had with Ernest Burgess, D. Kay Clawson, and Sig Hansen. In my opinion, they are truly world-class orthopædists."

Larry D. Iversen

Foreword

Major advances in orthopædics have followed breakthroughs in other disciplines with the discovery of general anesthesia, the roentgen ray, antimicrobials, inert metals and polymers, and advanced engineering developments ranging from mechanical design to fiber optics. But such breakthroughs lead to better patient care only when academic programs translate them into improved procedures and techniques, prove their effectiveness through clinical research, and then teach the better way to those who will become the practitioners of the future. It is in these roles that the University of Washington Department of Orthopædics has been a national and international leader for a quarter of a century.

While many practitioners embraced the entire field of orthopædics, the University of Washington faculty explored the concept of super-specialization as necessary for advancement of the discipline. Hand, spine, amputation-prosthetics, pediatric orthopædics, traumatology, sports medicine, and other domains became established as identifiable areas of super-specialization.

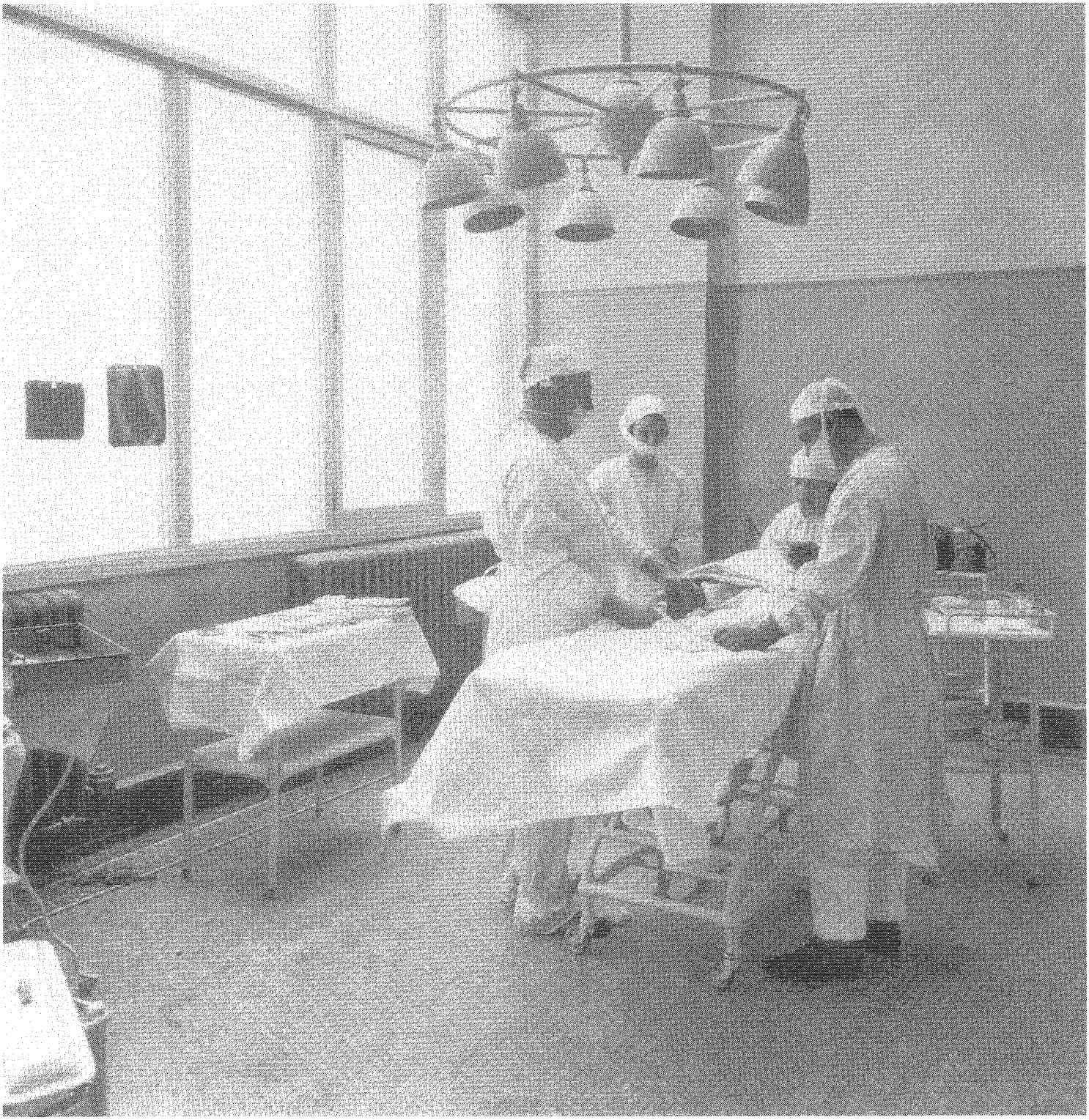
Perhaps of equal or greater importance was the development of an environment that challenged the status quo and refused to accept the premise that just because a famous orthopædist espoused a technique or philosophy, this was sufficient reason for its acceptance and perpetuation. At the University of Washington, advances were pioneered through documentation of existing treatment outcomes, followed by a reasoned plan for change, and then a prospective study for comparison of results.

From this approach came the development and popularization of such techniques and management concepts as the sliding hip screw in treatment of hip fractures, atraumatic amputation and immediate prosthetic fit, radical debridement of dense scar tissue and devitalized bone, prophylactic antibiotics, and skin closure over suction-irrigation in the management of chronic osteomyelitis. Clinical observation of pain in closed tibial fractures led to laboratory investigation and modern treatment of compartmental syndromes. Advancements in pediatric orthopædics included studies of torsional problems in children, laboratory and clinical studies on spina bifida, and end-result studies of early surgical management of congenital dislocated hips and clubfoot deformities. These approaches represented deviations from the conventional wisdom of the day, and have stood as major contributions to our field.

Perhaps the most lasting and meaningful activity placing the University of Washington Department of Orthopædics and the Seattle community as a national and international center is in the field of fracture management. Concepts of closed intramedullary nailing of the femur or immediate open reduction with secure internal fixation of fractures, and early weightbearing with the resulting shortened hospitalization and decreased expenses have gradually become accepted standards of care. The lives of severely traumatized patients are now being saved through immediate fracture fixation, even in patients with the most severe head and trunk injuries. These "Seattle concepts" have changed the practice of traumatology across the nation.

The last quarter century has placed the University of Washington Department of Orthopædics on the map as a national and international leader in orthopædic surgery. None of these accomplishments could have manifested without the challenges and support of the entire orthopædic community as well as the strong administrative support from the University that allowed for the creation of an educational and research environment that attracted the most able, creative thinkers into the residency program and onto the faculty. The seeds of inquiry and creative thought, once planted, have matured and many have been harvested, but the soil must continue to be worked and new seeds planted. Through this process, an environment has been created that identifies outstanding individuals and that encourages, at times drives, them to achieve beyond their own expectations or perceived abilities. An environment exists that says, emphatically, "Look to the past only for the lessons that can be learned. Live each day to work, to create, and to enjoy life to the maximum while planning for a future that can and must exceed all of the past accomplishments for the betterment of mankind."

D. Kay Clawson, M.D.



Operating room, Children's Orthopedic Hospital

Our Past

A Look Back to the Frontier

Doc David Maynard

Unless you count Meriweather Lewis (who had received a bit of medical training), the first physician in Washington was probably John McLoughlin, who arrived in 1824 to work for the Hudson Bay Company at its Vancouver post on the Columbia River. The first surgeon to come to the state may well have been Marcus Whitman, who settled near Walla Walla in 1836. There he cared for the settlers and the local tribes as well. When a measles epidemic killed many of the natives in 1847, he fell victim to a native tradition by which the family of the dead avenge themselves on the unsuccessful medicine man.

The first settlers arrived in Seattle in 1851, landing at West Seattle's Alki Point. Two years later the Washington Territory was established. Doc David Maynard arrived in the early 1850s after a harrowing trip from Ohio by mule and scow. He opened the first hospital (plus drugstore and notions counter) in Seattle where he treated a steady stream of folks, including Chief Sealth. To learn more of this fascinating doctor, lawyer, swindler, drinker, and Don Juan you must read *Skid Road* by Murray Morgan. The Sisters of Providence had established a poor house in Seattle; in 1878 they moved to a new building, which they named Providence Hospital. In the early decades of the twentieth century, Providence attracted orthopædist Bernie McConville, who would later be joined by Jack Callahan.

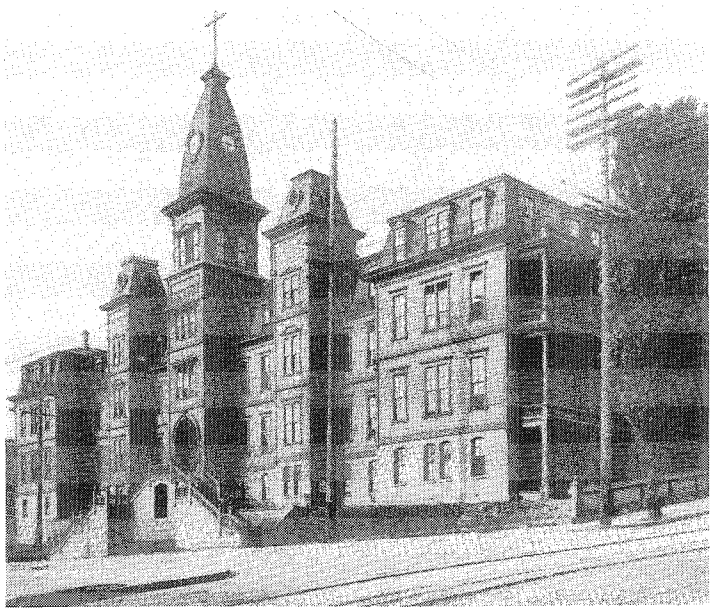
As the nineteenth century drew to a close and the twentieth century turned, the still young but growing city of Seattle could boast the opening of four new hospitals. King County Hospital was established in 1892, Seattle General in 1898, and Ballard Hospital in 1905. Children's Orthopedic Hospital was established in 1907, primarily to treat chronic bone and joint infections caused by tuberculosis. In 1910 a surgeon named Nils Johanson established Swedish Hospital in a two-story apartment building. Charles Eikenbary, a nationally recognized orthopædic surgeon, left his position as chief of staff at Spokane's Shriner Hospital to become chief of staff at Children's Orthopedic in 1926. John and Ed LeCocq also came to Seattle and established a group practice with Harry and Darrell Leavitt. The LeCocqs, the Leavitts, and later still, Irv Toole, joined the staff at Children's.

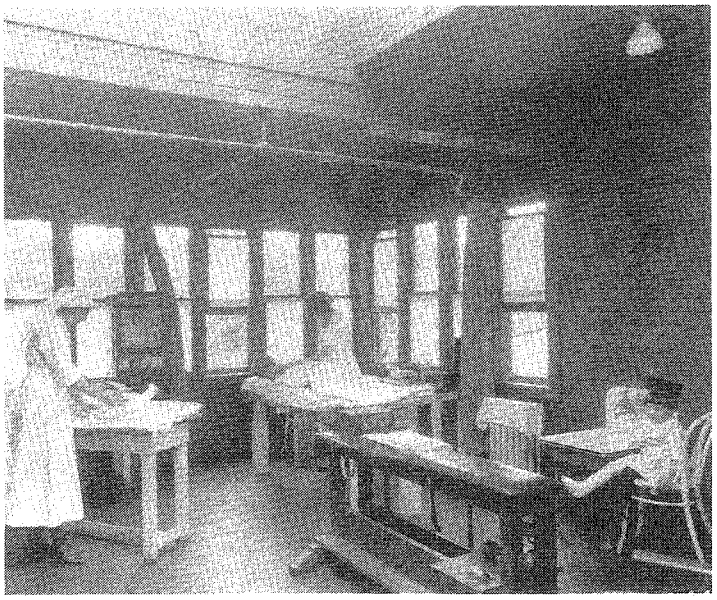
Programs for medical education and training were still dreams of the distant future, though the seeds had been planted in the frontier days. As far back as 1861 the Washington territorial government had passed legislation to establish a university that would include a department of medicine. This was a truly ambitious project for a territory that counted a population of less than 15,000—pioneering spirit indeed! Over the years numerous attempts to establish a school of medicine met the opposition of local physicians, who felt the continuing influx of doctors from elsewhere was sufficient to meet the needs of the populace.

As World War II drew to a close, the movement to establish a medical school was bolstered by several factors: (1) a shortage of physicians in the state, (2) returning veterans needing care, (3) applicants from Washington who wanted to attend medical school locally, and (4) local physicians who wanted continuing medical education. Fittingly, it was a surgeon and chief of staff at King County Hospital, David Metheny, who in 1944 took up the initiative to push for a medical school. On March 15, 1945, with the enthusiastic support of the Washington State Medical Association, Governor Walgren signed the bill to establish the University of Washington School of Medicine.

A practicing internist from Pennsylvania, Edwin Turner, was selected to be the first dean. Turner appointed a basic science faculty to start eight departments and interviewed and selected students for entry to the first medical school class in September 1946—a feat that cost him a peptic ulcer. In 1946 the school established its most important hospital affiliation—with King County Hospital (informally called Harborview for its city center location overlooking Elliott Bay). Large wards grouped patients according to their medical problems. The staff was closed, consisting of the University faculty

Providence Medical Center (photo by Ashahel Curtis)





Children's Orthopedic Hospital

and a few selected physicians from the community. Other affiliated institutions included Children's Orthopedic Hospital (renamed Children's Hospital and Medical Center in 1988), Seattle Marine Hospital (to become first the Public Health Hospital and later Pacific Medical Center), and Firlands Tuberculosis Sanitarium. All affiliated hospitals agreed that the University would be responsible for training of students and house officers and would approve staff appointments.

Thus, the groundwork was in place for the establishment of an excellent Department of Orthopædics: a very strong School of Medicine, clinical facilities for teaching and practice, and support from community physicians. These early leaders were a forward-looking group—plans were already in the works for a Veterans Administration Hospital and a University Hospital. In only three years since the founding of the school, Dean Turner had worked miracles.

Orthopædic Beginnings

Five years after the School of Medicine opened its doors, a one-person Division of Orthopædic Surgery was established with Robert D. Ray, M.D., Ph.D., an assistant professor of surgery, appointed head. Dr. Henry Harkins, the chair of Surgery and a strong and autocratic academician, valued Dr. Ray's solid commitment to education and research. According to Dr. Ray, he was selected as Division head because Henry Harkins was impressed with his research, rather than his clinical background, plus the fact that the UW couldn't find anyone else foolish enough to accept the job at the $6,000 salary.

In those early years a large part of the medical school faculty had been recruited from Harvard. In fact, Harborview (officially King County Hospital), the primary clinical facility, had earned the nickname "Harvard-view." A few orthopædic residents already had been recruited for the new training program, which was very fortunate to have the whole-hearted support of the orthopædic community.

The original residency program, based at King County Hospital, at that time was expanded to include Providence, Swedish, Children's, and the Veterans Administration Hospital. Saturday morning grand rounds were instituted at King County Hospital, and once the program was running smoothly, rounds were expanded to include a different collaborating hospital each month. In the new program, all of the residents were excused from clinical responsibilities one afternoon a week for a basic science review conducted at the University in cooperation with the Departments of Anatomy and Pathology. A monthly journal club included a dinner meeting hosted by Ted Chambers at the Seattle Yacht Club, and all of the clinicians were invited to participate. Each month the residents reviewed journals with orthopædic-related content such as the *Journal of Radiology*, the *Journal of Pediatrics*, and the *Journal of Physiological Reviews*. The orthopædic journals were excluded since it was assumed that everyone read them regularly.

The orthopædic laboratory program flourished with grants from NIH as well as the Atomic Energy Commission, and major research interests focused on fracture healing, bone immunology, bone graft-

Harborview Medical Center, 1931

ing, and the kinetics of calcium metabolism using radioactive isotopes as tracers. At this time, the government was conducting atmospheric testing of nuclear weapons, which triggered increasing concern about the fallout of strontium 90—a bone seeking isotope and a beta emitter with a half-life of forty-five years—extremely dangerous. One of the Division's projects focused on ways to mobilize strontium 90 from the skeleton, leading to the development of a method that was effective in eliminating this isotope from the body.

Dr. Ray invited Goren Bauer to join the UW faculty for a year as a research fellow. They developed a kinetic model of calcium metabolism, the first one based on human data using SR 87 as a tracer. They also carried out the first bone scans on humans at the VA Hospital. In 1954 (and again in 1970) Dr. Ray's laboratory group was awarded the Kappa Delta award for outstanding orthopædic research.

Although by 1948 plans were under way to develop a hospital on campus, the project encountered long delays in funding and construction. Meanwhile, Children's Hospital moved from its old facilities on Queen Anne Hill to the new location closer to the University. King County Hospital took over the old Children's Hospital as a convalescent hospital, which allowed Orthopædics to expand its services. At the time, the Division had seventy-five beds at King County and another seventy-five at the Queen Anne facility.

In those days, fractures of the femur were a common clinical problem. Roger Anderson and Ivan Loughlin were very active on the fracture service at King County Hospital, and the residents became experts with Roger Anderson's well-hip and well-leg traction and external pin fixation systems. This system was the forerunner of the many external fixators now in use. The story goes that skin care was not always optimal and seepage would occur around the pins. Roger Anderson called this fluid "serum." Critics adopted the term "Seattle Serum" to refer to infected drainage. They said it was colored salmon pink—a mixture of blood, pus, and tears. In 1948 the Judet brothers introduced replacement of the head of the femur for subcapital fractures. Dr. Anderson modified the Judet prosthesis with a nylon head, which turned out to be a major disaster: after 100, more or less, had been implanted, all had to be removed.

During this period John LeCocq headed the service at Children's and served as a pediatric orthopædic consultant for cases throughout the state of Washington. Bill Duncan, who had joined the COH staff in 1946, organized a cerebral palsy day school, as well as an inpatient service at the old tuberculosis sanitarium. The Division also affiliated with the Native Hospital at Sitka, Alaska. Each of the residents did a six-month rotation through the 100-bed pediatric orthopædics service, a very active program under the direction of Phil Moore. The service treated both Indian and Eskimo children, who had a high incidence of congenital dislocation of the hip, untreated club feet, poliomyelitis, and bone and joint tuberculosis. In addition to the clinical experience gained during the rotation to Sitka, the residents

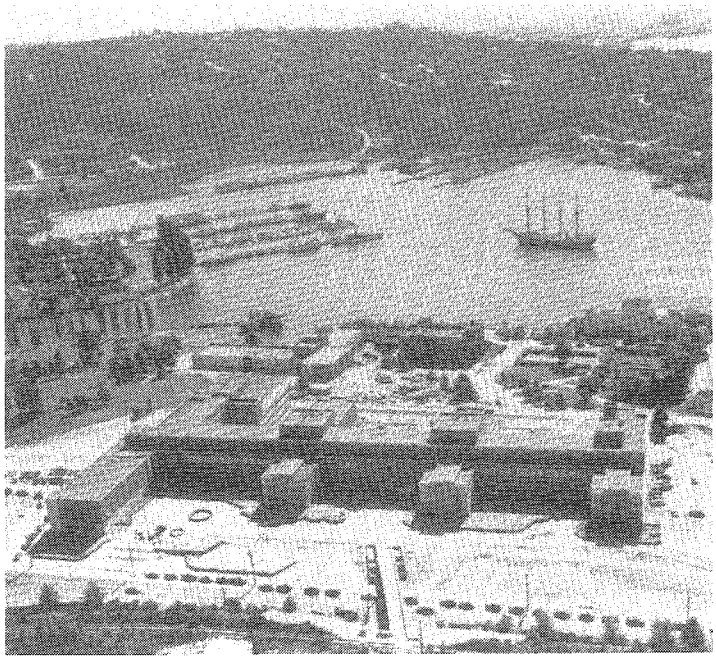
Robert D. Ray, M.D.

Division Head, 1951-1956

A native of Cleveland, Ohio, Robert D. Ray was educated in California, earning a B.A. in biology and an M.A. in anatomy from the University of California. He went on to Harvard Medical School, and after graduating in 1943, served a surgical internship at Peter Bent Brigham Hospital. His orthopædic residency training at Children's Hospital in Boston was interrupted by military service as a captain in the United States Army between 1945 and 1947. Upon completion of his military obligations, Dr. Ray returned to the University of California Medical School as an instructor in anatomy while working toward his Ph.D. degree. He subsequently completed his orthopædic residency training at the University of California Hospital in San Francisco. In 1948 Dr. Ray joined the University of Washington faculty as an assistant professor of surgery, and in 1951 he became associate professor and first head of the Division of Orthopædic Surgery, a position he held until 1956. In 1954 he was honored with a Kappa Delta Award for his outstanding research at the UW.

In 1956 Dr. Ray was appointed to succeed Dr. Freemont Chandler as professor and head of the Department of Orthopædic Surgery at the University of Illinois Hospital, Abraham Lincoln School of Medicine. Dr. Ray received his second Kappa Delta award in 1970 for his study in "Sintered Fiber Metal Composites as a Basis for Attachments of Implants to Bone."

Dr. Ray is now retired from academic orthopædics and he and his wife, Genevieve, are living in California and are enjoying their interests in France, the cultures of Europe, photography, their five children, and their grandchildren.



Unit 1 of the Health Sciences Center, 1949

all returned with bear rugs and a locker full of smoked salmon—courtesy of Dr. Moore.

As the Orthopædic program developed, it became increasingly apparent to Dr. Ray, but unfortunately not to Henry Harkins, that the Division required more than one full-time member to cover the undergraduate teaching program and the residency training program, to attend staff meetings and cover rounds at each of the affiliated hospitals, to supervise the active clinical service at King County Hospital, to keep up with the clinical service at the VA Hospital, to write grant applications, and to conduct research. Furthermore, Orthopædics, as a division of General Surgery, was on the short end of the budget allocations. The Department of Surgery had a budget of something like $56,000 a year for secretarial help, supplies, and office expenses, of which $2,000 was to go to each of the three divisions (Orthopædics, Neurosurgery, and Urology) and the remainder to General Surgery. Unfortunately, General Surgery used up all of the funds within the first six months, so the other divisions were informed they would have to run their sections out of grant funds since there would be no money from the University.

Another primary concern at the time was a movement to place a limit on patient care fees that the University and its faculty might generate. Substantial restrictions were applied, including the stipulation that University faculty "may accept as personal patients only patients referred to them in writing by other physicians." Apparently it was assumed that a quality full-time faculty could be retained with incomes substantially below those of other practitioners, and furthermore, that patient care dollars were not needed to support the research and teaching missions of the school. Both assumptions proved to be false.

The honeymoon was over: the Division of Orthopædics had little bargaining power with Harkins and none with the dean or the administration. Dr. Ray felt that the only answer was to leave and let the University recruit a new head who, during his own honeymoon, perhaps could resolve the problems. In 1955 Dr. Ray accepted the offer to become professor and head of the Department of Orthopædics at Presbyterian Hospital in Chicago. He returned to visit the UW on many occasions, and in 1972 was selected to deliver the annual LeCocq Lecture on the topic "Bone Grafts and Bone Implants."

Transition

As professor and chairman of the Department of Surgery, Henry Harkins undertook a nationwide search for Dr. Ray's successor. During the interim (1955-1958), John LeCocq served as acting head of the Division of Orthopædics with the support of Kirk Anderson as director of research, Ernest Burgess, director of resident education, John Callahan, director of basic science education, and William Duncan, director of the service at Children's Hospital. A remarkable man, Dr. LeCocq took substantial time away from his private practice to lend his support to the development of the orthopædic program at the University. Dr. LeCocq brought together the entire orthopædic community to maintain the quality of the teaching program, as well as the clinical coverage at affiliated hospitals. By his example he defined the concept of what a clinical faculty member should be. A permanent commemoration of Dr. LeCocq's contributions was the initiation of the John F. LeCocq Lectureship in 1965. This lectureship endures not only as one of the academic high points of the year, but also as the symbol of the strong relationship between the University, the Department, and the non-University orthopædic surgeons in the community.

John F. LeCocq

During the LeCocq years, the search committee was engaged in ongoing recruitment discussions with D. Kay Clawson, then a faculty member at UCLA. Dr. Donald King, professor and chairman of the Division of Orthopædics at Stanford, had strongly recommended Dr. Clawson for his commitment to teaching, his quality patient care, and for his organizational skills.

Coming of Age

Appointed head of the Division of Orthopædic Surgery in 1958, D. Kay Clawson immediately set to the task of strengthening the medical student and resident teaching programs as well as the research and clinical activities of the Division. Importantly, he was able to win agreement from the School of Medicine that Orthopædics would establish the hand surgery training program at the University of Washington and would share responsibility for low back and peripheral nerve surgery with the Neurosurgical Service. Active research under way at that time included Dr. Clawson's studies in osteogenesis and tetracycline fluorescent properties of bone, Dr. Anderson's studies in the use of bovine bone for bone graft (for which he received the Kappa Delta award), as well as Harry Kretzler's studies on the use of cerclage in fracture treatment.

The new University Hospital was completed in 1958. Other clinical sites for the Division included King County Hospital, the Veterans Hospital, Children's Orthopedic Hospital, the Shriner's Hospital in Spokane, and Swedish and Providence Hospitals in Seattle. Clinical faculty appointments were offered only to those individuals who were actively involved in the teaching program, and included Roger Anderson, John LeCocq, Ira MacLemore, Edward Chambers, Lewis Edmonds, Darrell Leavitt, Irving Tuell, Kirk Anderson, William Duncan, Harry Emmel, James Miller, John Stewart, John Callahan, Forrest Flashman, Park Gloyd, Ernie Burgess, Ivan Loughlen, Ken Martin, Garth Mooney, Ed Rogge and Harry Leavitt. [Harry Leavitt was a short, gruff, but interested attending, who decided whether a disc needed to be removed by seeing if he could inject it with one cubic centimeter of saline. The preoperative arguments by the Leavitt brothers outside the OR were legendary.]

Serious problems arose during these early years. Medical students came on the wards with little knowledge of the musculoskeletal system: the classroom lectures were not getting the job done. The teaching base at the primary hospitals did not provide the residents with exposure to common orthopædic problems or with a sufficient basic science education. Charles Andrews, appointed an instructor in 1959, became the first faculty member to leave academia for private practice, complaining that his workload was equal to that of a private practitioner yet his pay was not. Student teaching hit an all-time low, with many clinical faculty "no shows" at lecture time. Orthopædics was short of full-time faculty. The Division was operating virtually without a state budget and depended entirely on research grants to maintain its academic programs. Continued restrictive policies at the University Hospital limited the size of clinical practices. Dr. Clawson argued against these policies by asserting that faculty needed the opportunity to develop substantial practices to provide resources for reasonable faculty compensation and for the Division's teaching and research responsibilities.

In an effort to improve the clinical experience for residents, the Division entered into a contract with the U.S. Public Health Hospital in November 1960. The senior resident became commissioned in the Public Health Service. John Neufeld, who entered the residency program in the late sixties, recalls two notable aspects of rotations at the Public Health Hospital: the attendings "stayed out of the way," letting the residents assume significant responsibility for patient care, and the men's room offered an outstanding view of downtown Seattle and Elliott Bay.

A number of positive developments signalled a turn for the better in 1961. Dr. Clawson initiated a consultation clinic in Juneau, Alaska—the Division's first satellite clinic. On the financial front, Dean Aagaard announced that the surgical divisions of Neurosurgery, Urology, and Orthopædics were to be separated from the General Surgery budget. Dr. Clawson was promoted to associate professor with tenure, with an annual salary of $16,812, and was authorized to garner an additional $10,688 from his clinical practice. Wayne Akeson, an assistant professor at the University of North Carolina, was recruited to develop the research laboratory, with three half-days a week designated for research. Lawrence Gordon was conducting research in myelodysplasia and was active in the leadership of the King County Hospital.

Funding of the Division, inadequately "housed" in a fourth-floor hospital corridor next to the elevators, continued to be a major problem. The Division scraped by on a $1,000 per year operations budget and state-appropriated funds for only one secretary. The remainder of the secretarial services were supported by the research grants of Dr. Clawson and Dr. Anderson.

At this point a difference of opinion arose between the full-time faculty and some of the clinical faculty over control of the residency training program. Dean Aagaard declared that it was essential for the head of the Division of Orthopædic Surgery to be responsible for the administration of the teaching, research, and patient care programs, including the selection and rotation of residents. The dean was supported in this decision by many community orthopædic surgeons, including John Stewart, David Anderson, Park Gloyd, Ed Rogge, and Irving Tuell. [A brief parenthetic note about Irving Tuell is in order here. Dr. Tuell was committed to demonstrating the mechanism of "whiplash" and to debunking the outrageous damages claimed by some patients. In a show of dedication to his research that few investigators would care to replicate, he sat in his car as it was deliberately and repeatedly rear-ended at progressively higher speeds so that movies could be made of his head and neck motion during whiplash. Even though he recently passed away, Dr. Tuell's support of the Department continues through the funds he donated to establish the Esther Whiting Award (made possible by the contributions of a grateful patient) for the best resident paper with a historical perspective.]

D. Kay Clawson, M.D.

Chairman, 1965-1975

Born in Salt Lake City, Dr. Clawson graduated from the University of Utah, earned his medical degree at Harvard (1952), and did his orthopædic residency training at Stanford (1954-1957). He expanded upon this training through a fellowship in advanced orthopædics at the National Foundation for Infantile Paralysis, and as a first assistant to Professor H.J. Seddon at the Royal National Orthopædic Hospital in London.

Dr. Clawson's talents and abilities came to the fore early in his career. He spent only a year as an assistant professor of orthopædic surgery at UCLA before being tapped to head the Division of Orthopædic Surgery at the University of Washington—a rise that today would be described as "fast track." Recognition of Dr. Clawson's outstanding leadership qualities brought him increasing responsiblities well beyond the halls of the UW Health Sciences Center. Over the years he served on numerous committees of the American Academy of Orthopædic Surgeons and other national associations. He demonstrated his organizational talents while chairing the National Residency Review Committee through its most important years, building the committee into an effective quality control organization for residency training programs.

After seventeen years of outstanding service to Orthopædics at the University of Washington, Dr. Clawson resigned the chairmanship in 1975 to accept an appointment as dean of the College of Medicine at the University of Kentucky. He admirably filled that position until 1983 when he assumed his current post as executive vice chancellor of the University of Kansas Medical Center, where he also continues his involvement in his specialty as a professor of orthopædics. Still active on the national level, Dr. Clawson is immediate past president of the Association of American Medical Colleges, a member of the Council for Medical Affairs of the American Medical Association, and a sought after lecturer and visiting professor at institutions nationwide.

Reflections from the Chair

This publication commemorates twenty-five years of departmental status for Orthopædics, but it should be acknowledged that by 1965 the difficult tasks had already been accomplished and the groundwork laid for a successful department. The database had been established and it proved conclusively that orthopædics, as well as other surgical specialties, could not reach their full potential in an environment dominated by general surgical thinking. We will, indeed, be forever indebted to Deans George Aagaard and John Hogness for the courage they displayed in bringing departmental status to Orthopædics. It was a decision that was not warmly received by many clinical and basic science departments (but one, I feel safe in saying, all departments now recognize as being correct).

The early strength of the orthopædic program at the University of Washington was founded in its undergraduate educational offerings. Deprived of required time in the curriculum, we developed innovative and well-structured clerkship experiences to entice more than 95% of our medical students to take orthopædic electives during their fourth year. This experience resulted in a wealth of outstanding UW applicants to the residency program. My challenge to applicants from other schools then became: "What makes you think you're good enough for this program?" That challenge and the quality of their education brought a number of outstanding residents, which further improved the undergraduate teaching, research, and patient care programs.

The highly structured basic science offerings, before the availability of the orthopædic in-training exam, ensured that the fundamentals were ingrained in the minds of the residents as a prelude to expanded clinical responsibility. The integrated residency program, taking advantage of university, county, federal, and community hospital rotations, provided one of the most outstanding clinical experiences in the country. The requirement that each resident complete a thesis before graduating, coupled with opportunities for postgraduate study in the basic science departments and the expanding orthopædic laboratories, or study in other institutions in the United States or abroad, were the fundamental ingredients that allowed the University of Washington's program to rise to within the top ten in the nation before the Department was ten years old.

As the early leader and the founding chairman, I salute the individual contributions of the many students, residents, and full-time and clinical faculty that made this exciting and productive environment a reality.

In those days there was no text of practical orthopædics. Dr. Clawson thus began developing his well-known "party line"—a group of guidelines for a basic approach to common orthopædic problems. The purpose of the party line was to provide the residents with one good way of approaching each of the common clinical problems in orthopædics, so they would not be besieged by a wide variety of techniques while mastering none. The rule was that if a resident followed the party line, everything would be fine. If a resident deviated from the party line yet got an excellent result and could defend his approach, all was okay. However, if deviation produced anything but an excellent result, the resident was sure to become the victim of a "shaker." For those who have never experienced this phenomenon, Dr. Clawson had a unique way of manifesting anger. He would rise to his full height, stiffly extend his neck with eyes fixed on the victim, turn reddish, and begin to tremble. There then ensued a rapid succession of precisely articulated and unminced words that usually converted the recipient to a whimpering jelly-like mass. The magnitude of the tremors that preceded the verbal eruption were measured on the Richter Scale, indicating the level of anger that had been engendered.

Dr. Clawson subsequently published the "party line" in book form in conjunction with Larry Iversen, a resident graduate from 1977. Titled the *Manual of Acute Orthopædics*, this work is widely used by medical students and beginning residents.

The administration of the medical school progressively began to recognize the complexities of maintaining an academic orthopædic unit. The challenge of ensuring research time became a priority for both Dr. Akeson and Dr. Louis Fry, who joined the faculty in 1962.

Larry Iversen and D. Kay Clawson at work on the Manual of Acute Orthopædics.

Dr. Fry had completed a two-year fellowship in subcellular anatomy and electron microscopy in the Department of Anatomy. He also is remembered for his unusual "filing system" (a collection of loose papers kept in the trunk of his car) and for his leadership of the orthopædic physician's assistant program. This program was supported from 1971-74 by Veterans Administration funds obtained by Dr. Clawson. Although short-lived, this two-year training program produced a number of highly successful graduates including Ivory Larry, Jim Ghiglione, Mike Ball, Joel Kwakenat, Ted Daley, Carlos Aguero, Mike Coleman, Carol Henry, David Connerly, and Ralph Johanson.

March of 1964 saw the successful recruitment of Dr. T.K.F. Taylor, who had been the top student of Professor Joseph Truetta from Oxford. Dr. Taylor, easily recognized by his turned up collar, was an active, somewhat opinionated, teacher who greatly enhanced the educational and clinical programs.

Independence and Maturation

After several years of intense "educational effort" by Dr. Clawson and the other surgical chiefs, the School of Medicine was ready to grant new recognition to the surgical specialties. On November 1, 1964, the new dean, John Hogness, established autonomy for the Divisions of Neurosurgery, Urology, and Orthopædics. All budget, payroll, travel, personnel, appointments and promotions, grants, and other such activities were to be carried out by the heads of the new departments, who in turn reported to the office of the dean. Orthopædics gained departmental status on July 1, 1965, thereby firmly establishing its position as a discipline distinct from general surgery.

The year 1965 saw the enhancement of our enduring relationship with Children's Hospital: both the Department and Children's recognized a shared destiny in teaching, clinical research, and patient care. This functional relationship became an excellent one for both medical student and resident education. Negotiations were under way with the Veterans Administration Hospital to provide reasonable compensation for the clinical services there. When negotiations broke down, the Department withdrew from the VA Hospital until Senators Henry M. Jackson and Warren S. Magnuson intervened, leading to an appropriate contractual relationship.

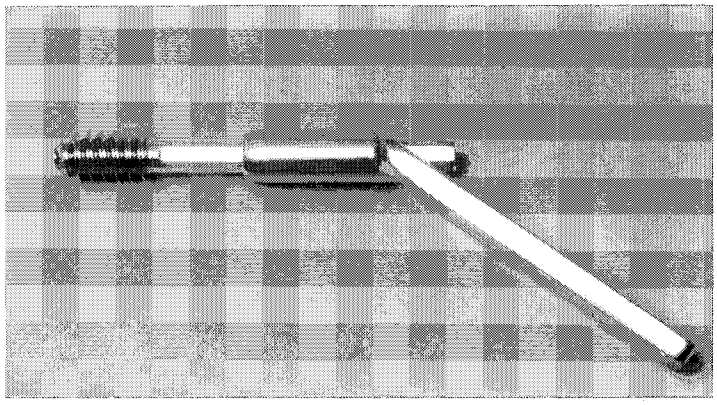
By 1966 research activities had grown remarkably so that ten people were paid from grants. Wayne Akeson was conducting research on the hip joint and also was involved with studies of connective tissue; D. Kay Clawson was involved in hip prosthesis research; T.K.F. Taylor was working on rabbit discs, and Kirk Anderson was working on calf bone. In this year the Department also initiated a Continuing Medical Education program with a course demonstrating its leadership in a number of areas: amputation and prosthetics led by

Drs. Burgess and Romano; ligament injuries led by Dr. Anderson; wrist injuries by Dr. Akeson; spine injuries by Dr. Taylor; and osteomyelitis by Dr. Clawson. In 1967 Dr. Clawson was awarded the prestigious ABC Traveling Fellowship to visit the major orthopædic programs in England, Scotland, and Scandinavia. Also in that year, William Souter from Edinburgh, Scotland accepted a position as a senior fellow to work in the orthopædic laboratories and on the Rheumatology Service. Dr. Souter has subsequently gone on to become one of the foremost surgical rheumatologists in the United Kingdom.

These activities gave evidence to the Department's expanding scope and rising stature. Nevertheless, the sailing was not all smooth for the fledgling Department. Problems and challenges of the era included maintaining adequate coverage at the various hospitals with part-time attendings: they found it increasingly difficult to meet their outpatient appointments and were leaving more and more of the care to the residents. The University Hospital was experiencing budgetary problems. The position of orthopædist-in-chief at the newly renamed Harborview Medical Center, vacant since 1965, had not been filled because recruitment was jeopardized by concerns about funding the hospital's mission to care for the needy. Dr. Clawson temporarily assumed this position and moved the Department chairman's office over to Harborview. Finally, Donald Gunn, formerly professor and chairman of the Department of Orthopædics in Singapore, joined the department in 1968 as chief of orthopædics at Harborview.

At the untimely death of Charley Dockhorn in 1969, Stewart Scham accepted the position of full-time instructor and consultant to the Congenital Defects Clinic at the University Hospital. Ted Hansen and David Shurtleff also became active in this program and moved with the clinic to Children's Hospital in 1971. After Dr. Hansen began devoting more time to clinical work at Harborview, the charge of the Congenital Defects Clinic was assumed by 1958 graduate Harry Kretzler, who showed an absolute dedication to these children and strove to provide them and their families with the best in personal care.

Under Dr. Clawson's continued leadership, the Department of Orthopædics continued to strengthen all aspects of its three-fold mission of clinical excellence, innovative research, and dedication to medical teaching. At this juncture in our history, the foundation has been laid for the Department as we know it today. Some 20 years of growth and development remain to be unfolded on these pages. Space limitations and the need to keep our story moving along forbid a year-by-year detailed recitation of the innumerable events and all the faculty comings and goings that have given form and substance to our past. Highlights and selected insights must serve to carry the story onward.



Sliding hip screw

Clinical Activities

In the area of clinical innovations, the mid sixties saw much interest directed toward the use of intramedullary nailing in the management of femoral shaft fractures—a development in which the University of Washington played a major role. This aspect of our history merits a significant place in the spotlight, so we direct you to the side story, "Tales of the Nails," based on narratives contributed by Ted Hansen, Ivory Larry, and Bob Smith (aka "Captain Crunch").

Another important advance was the sliding hip screw. Dr. Clawson was familiar with the development of the von Pohl screw invented by Dr. Ernest von Pohl of Kiel, Germany. With the aid of Calvin Griggs, a design engineer, Dr. Clawson and the Richards Medical Company designed and manufactured some modified von Pohl screws that included the "key" and "key-way" to prevent rotation of the lag screw, and buttress threads on the lag screw and compression screw. The latter initially compressed the fragments, yet permitted the lag screw to slide laterally and distally, maintaining contract between the fracture surfaces.

With minor modifications, their design has remained intact to the present day. This implant has virtually revolutionized the care of intertrochanteric hip fractures and has played a significant role in the management of femoral neck fractures as well. Copies of the original blueprints and a gold-plated copy of the original adjustable hip screw are housed in the Clawson Library, along with other artifacts and mementos of Dr. Clawson's tenure as chair.

In 1964 Dean Aagaard, on behalf of the University and the Division, had strongly endorsed a prosthetics research grant submitted to the Veterans Administration by Dr. Burgess. The support of the University was instrumental in establishing a program that later evolved into the Prosthetics Research Study. In 1969 Dr. Burgess established a Division of Prosthetics and Orthotics to coordinate care of the amputee throughout the University system. Dr. Burgess was a proponent of the immediate fit prosthesis, a technique developed by Dr. M.

Weiss of Poland, and had popularized its use in the United States. Dr. Burgess held a unique philosophical approach to amputation, regarding it as a reconstructive rather than a destructive procedure. His innovations and collaborations with the University faculty have led to many improvements in function for the amputee. In partnership, the Department and the PRS would go on to do front-line research in wound healing, the effects of pressure on swelling, the use of transcutaneous PO_2 in predicting wound healing, and in the automated manufacture of prostheses.

Educational Programs

On the educational front, the residency program in the late sixties and early seventies was gaining wide recognition for its excellence. The program had been extended to five years in 1968, one year of internship and four of orthopædic surgery. By the early seventies second-year residents were required to pass a rigid course in anatomy before being allowed to operate, even under supervision, and late Monday mornings became the allotted time for dissections. A weekly pathology quiz was instituted, as were lectures to teach the basic sciences. Each affiliated hospital conducted its own clinical teaching conference, and in addition, a major teaching conference occurred on the first Saturday of each month at Children's Orthopedic Hospital.

A monthly journal club held in the Clawson's home emphasized the history of orthopædics. Attendance at all of these sessions was mandatory, and residents who were absent or chronically tardy were put on probation. Perhaps an even greater inducement to attend the journal club were the sumptuous desserts served by Mrs. Clawson, who always showed the residents the warmest hospitality.

During the mid sixties the School of Medicine introduced a new curriculum and the Department of Orthopædics played a key role in developing and teaching the Musculoskeletal Core Course. Cornelius Rosse of the Department of Biological Structure and Dr. Clawson, along with members of the Musculoskeletal Teaching Committee, published a book entitled *Introduction to the Musculoskeletal System* that became the backbone of the Musculoskeletal Core Course. The medical students appreciated the high quality of their education in orthopædics and in subsequent years the Department won a number of awards for outstanding teaching.

In 1973 Dr. Hansen initiated the resident retreat or "camp" for all entering residents, held for many years at the University's Lake Wilderness retreat center. Dr. Hansen's concept was that the incoming residents should be taught the general philosophy of the Department and should be brought up to speed on emergent patient evaluation and care, skills that they would need as soon as they began their clinical rotations. The camp provided opportunities for the incoming residents to get to know each other and to participate in injury-producing sports (giving some life to the plaster-practice sessions). The retreat also emphasized training in motor skills, a program that was the forerunner of the now widely accepted Skills Laboratory popularized by Fred Lippert.

Faculty in Flux

Inadequate faculty salaries, heavy clinical loads, and low monetary return to the Department from clinical activities proved hindrances to attracting and retaining faculty during these years. Wayne Akeson, then associate professor, was recruited by the University of California, San Diego, to assume the position as professor and chief of the Division of Orthopædics. The loss of Dr. Akeson was accompanied by a reduction of research support for Richard Convery, who had joined the faculty in 1967, and Dr. David Grainger, a faculty member since 1969. Dr. Akeson soon recruited Dr. Convery to join him in San Diego, seriously weakening the Department's program in arthritis surgery and depriving the Department of a quality investigator. In a series of 100 consecutive total hip replacements, Convery had been able to show that early activity alone was a most effective prophylaxis against pulmonary emboli. He also had demonstrated the ability of pony knees to fill in full thickness but not partial thickness chondral defects. In 1973 he would receive the Kappa Delta award for his paper written during his time at the University of Washington entitled: "The Relative Safety of Polymethylmethacrylate: A Controlled Clinical Study of Randomly Selected Patients Treated with Charnley and Ring Total Hip Replacements."

Purple and Gold

In 1968 UW President Odegaard asked that the Department of Orthopædics care for the intercollegiate athletes to ensure both quality and continuity of care. Dr. Clawson got a flattop haircut, a purple shirt, and gold coat and became the team physician for the Huskies. Subsequently, the Department recruited Dr. James Garrick to head the Division of Sports Medicine and serve as team physician. As a resident at the Mayo Clinic Dr. Garrick, an energetic and colorful individual, had managed to secure some rotations at ski areas, where he became interested in the epidemiology of sports injuries and injury prevention (as well as aprés ski).

Dr. Garrick established a Sports Medicine Clinic in the Hec Edmundson Pavilion as a free-standing clinical unit of the Department. Rumor has it that the Athletic Department liked long cleats and Astroturf because of the improved traction they offered when football players cut sharply. Garrick lost favor with the Athletic Department when his epidemiological studies showed that this cleat-turf combination resulted in more injuries.

A Period of Rebuilding and Moving "Up"

With Dr. Akeson's departure in 1970, it was decided to rebuild the research program along bioengineering lines with the recruitment of Angela LaVigne, Ph.D., an aeronautical engineer, and John Nillis, a

bioengineering postdoctoral fellow. Their research focused on the use of sintered metal for prostheses to allow for ingrowth of bone—an idea whose time had not yet come.

Ed Almquist, a clinical faculty member, established an excellent hand clinic at the University Hospital and initiated an active research program at the UW Primate Center. His laboratory helped develop the concept of central nervous system reorganization following nerve repair—i.e., the brain can accommodate for axons that regrow in a different orientation than existed prior to injury. Dr. Almquist also pioneered the use of the argon laser in nerve repair, and continues his productive investigations to the present day.

David Chaplin, from Birmingham, England, joined the faculty as an assistant professor to head up the arthritis surgery effort. Theodore Greenlee, an alumnus of the residency program, returned to the University of Washington as a faculty member after serving on the faculty at the University of Florida with Bill Enneking. Fred Lippert, who trained at the University of Vermont, joined the Department after completing his doctoral degree in bioengineering with Professor Karl Hirsch in Sweden.

Also in the early 1970s, Dr. Clawson obtained a Bureau of Health Manpower contract to study orthopædic manpower in the United States. He developed estimates of the number of orthopædists needed per unit of population, as well as the impact of the number of orthopædic surgeons on the amount of surgery performed. Dr. Clawson's manpower studies pointed out the maldistribution of orthopædic surgeons in the United States, and in particular, the shortage of academic orthopædists.

Seven years after its founding, the Department of Orthopædics moved up in the world, literally and figuratively, with the acquisition of office space befitting a full-fledged department of the medical school. In 1972 the Department moved from its cramped location in the hallway on the fourth floor of the University Hospital to the new clinical "BB" tower, where it occupied 5,600 square feet on the tenth floor, with offices, a library conference room, and research laboratories dedicated to biochemistry, tissue culture, histology, and bioengineering. Dr. and Mrs. Edgar A. Rogge generously provided funds for the carpeting of an orthopædic library and conference room. Named the Rogge Library in their honor, the room displays a portrait of the late Dr. Rogge. Celeste Rogge continues to be a loyal supporter of the Department as does their son Lee, also an orthopædist.

The School of Medicine recognized the problems of restrictive policies on compensation for clinically active full-time faculty, which led to difficulties in: (1) retaining quality faculty against the lure of private practice, (2) establishing an appropriate clinical experience for students and residents, and (3) ensuring the availability of clinically-generated funds to support the research and training programs. As a result, 1972 saw the institution of the incentive plan designed to return a portion of practice plan earnings back to clinically active full-time physicians and their departments. At the same time, the Department of Orthopædics worked to keep non-University community orthopædic surgeons involved in the teaching programs at the University Hospital and at Harborview as part of the clinical faculty program.

Despite the School's attempts to provide a more attractive package for active practitioners, it remained difficult for the Department to retain quality faculty—especially when non-University orthopædists could continue to play a substantial role in the resident teaching program. In 1973, Don Gunn resigned his position as chief of orthopædics at Harborview to enter private practice in Seattle. In his case, as with subsequent departures, the Department of Orthopædics would lose an outstanding teacher and clinician as well as a large patient following that had been built up within the University system.

Dr. Clawson asked Dr. Hansen to accept the position vacated by Dr. Gunn. The quid pro quo was that the Harborview Medical Center would remodel the sixth floor exactly to Dr. Hansen's specifications, including semiprivate rooms, new offices for the faculty, satellite record keeping, satellite X-ray, orthopædic call rooms, a new clinic and appointment system, and the innovation of bars along the walls that served both as walking supports for patients and to protect the walls from carts and beds. Dr. Hansen's firm negotiations made Harborview a much more attractive and efficient place for both patients and faculty.

Two additions to the Department in 1974 were Dan Spengler and Rick Matsen. Dr. Matsen joined the faculty after graduating from the residency program. He devoted his clinical and research attention to problems of the shoulder and in the ensuing years took on increasing administrative responsibilities, leading to his appointment as chair in 1986. Dr. Spengler had completed his residency training at the University of Michigan and joined the Department to head up the Spine Program after a one-year fellowship with Al Burstein in Cleveland. The studies of industrial low-back pain initiated by Dr. Spengler and his team have continued to be one of the Department's outstanding research programs. Dr. Spengler remained with the Department until 1983, when he left to become the chairman of orthopædics at Vanderbilt University.

From all appearances the Department of Orthopædics was in a very strong position in August of 1974. Consequently, just about everyone was caught by surprise when Dr. Clawson resigned his chairmanship to become dean at the University of Kentucky School of Medicine. Dr. Hansen was named acting chairman, and a Review and Search Committee was appointed composed of John Bonica (chairman), Ernest Burgess, Barbara DeLatour, M.B. Everett, Melvin Figlee, William Kelley, Robert Rushmer, Jane Schaller, and John Stevenson.

This committee summarized the accomplishments of the Department of Orthopædics under Dr. Clawson's leadership as follows: (1) He had developed a highly deserved local, regional, national, and

international reputation. (2) Quality patient care was provided by the faculty and was the cornerstone of its clinical education program. (3) The student education program was excellent. (4) The residency program attracted outstanding applicants. (5) The Department had established a recognized research program, ranking tenth in the nation in grant funds and receiving numerous awards for the research conducted by the faculty. (6) The Department had successfully integrated excellent clinical faculty from the community into its patient care and teaching programs. (7) Dr. Clawson had served as an outstanding leader, not only of the Department, but also within the School of Medicine.

Dr. Clawson's philosophies continue to run strongly through the Department, along with such Clawson aphorisms as: "edema is glue," "no blood—no bone," "dilution is the solution to the pollution," "anatomic reduction and early motion," and many more. The departure of this great leader, teacher, innovator, and clinician left a great void within the Department. Could deaning in Kentucky be as much fun as teaching us how to expose the femur with the skin incision or how to differentiate claw toes from hammer toes?

Changing of the Guard

During this time all eyes focused on the Search Committee as it considered such applicants as Vert Mooney, Gus White, Warren Stamp, and Victor Frankel. The committee had identified a need for a strengthened research program, and thus offered the position to Victor Frankel, who was well known for his biomechanical research with his colleague Al Burstein at Case Western Reserve.

Victor Frankel was a positive, ingenious, supportive, and well-connected leader. He and his gracious wife Ruth brought a new dynamism to the Department of Orthopædics. As chair, Frankel set to the task of strengthening the full-time faculty by supporting academic promotions. Moving to full professor were Ted Hansen and Lynn Staheli, who had joined the full-time faculty in 1975 as head of pediatric orthopædics at Children's Hospital. Drs. Spengler and Chaplin moved to associate professor, as did later hires Bob Winquist and Rick Matsen. These promotions gained deserved and needed recognition for those who had made a strong commitment to the Department.

Dr. Frankel spent a considerable amount of time on the road promoting the Department and its faculty. He pushed "his boys" at the national level; faculty found themselves on national committees of the Academy and received speaking invitations from all over the nation. New faculty were brought on board. Letha Hunter joined the Sports Medicine team along with Steve Bramwell and clinical faculty members Jim Smith, Harry Kretzler, and John Olerud, a dermatologist and former baseball great (a talent he passed along to his son John, Jr.). Former resident Richard Zorn joined the team at Harborview. Allan Bach, also a graduate of our residency program with subsequent training in Sweden in hand surgery, led the Hand Service along with Bob Foster, who had trained at the University of Colorado and joined the Department in 1980. Dr. Foster became the director of the resident education program and the fellowship program and was chief of outpatient services at Harborview. Bob was a tough, but fair director, warning the residents that there was "a bear trap waiting for them in every corner" once they entered the practice of orthopædics.

Dr. Stan Bigos joined the Department in 1980 to work with Dan Spengler and Alf Nachemson, a visiting back specialist from Gothenberg, Sweden. Another spine specialist, Dr. Howard King, also joined the faculty, bringing expertise in the management of spine deformities acquired at the Twin Cities Scoliosis Center, as well as expertise in the so-called "Socratic" teaching methods learned from Dr. Sherman Coleman during his residency training at the University of Utah. Frankel was systematically building a strong, energetic team of full-time faculty.

Dr. Frankel also set to work enhancing the orthopædic research programs, making sure that all of the activities of the Department had "the smell of science." A speculative investor, Dr. Frankel held that the Department had to "spend money to make money." He recruited an outstanding young scientist, Dennis Carter (UW Ph.D. in mechanical engineering), from Stanford to head up biomechanical research. Dr. Frankel worked valiantly to secure a tenured faculty position for Dr. Carter to solidify quality research within the Department. Unfortunately, the School of Medicine did not allow state funds to be used to tenure a basic scientist in a clinical department. Dr. Carter, an excellent investigator, teacher, and faculty member, left for Boston to work with Bill Harris, the specialist in total hip replacement at Massachusetts General Hospital.

Dr. Frankel devoted considerable time and attention to the Department's relationship with the non-University community orthopædic surgeons, involving them in various programs and easing the criteria for appointment to the clinical faculty. Dr. Frankel also enjoyed teaching. He based many of his lectures on his previous research, including work with a "telltale" hip nail (one that would broadcast information on the loads across it) to investigate the forces borne by a fixation device in femoral neck fracture. With physical therapist Margareta Nordin and editor Lori Glass, he produced the textbook *Musculoskeletal Biomechanics,* now in its second edition and a widely used reference and text.

At this point the story of the Sports Medicine Program should be resumed. Dr. Garrick left the Department to move to Arizona to work with the Goldwater Foundation. Care of the varsity athletes was then assumed by Steve Bramwell, a former resident of the Department of Orthopædics who in his undergraduate years had been a member of the varsity Husky football team. Although he was happy on the faculty as the chief of Sports Medicine, Dr. Bramwell wanted

Victor H. Frankel, M.D.

Chairman, 1976-1981

Victor H. Frankel was born in Wilmington, Delaware, a fact known by virtually everyone he has met on even a casual basis. He earned his undergraduate degree at Swarthmore College, his medical degree at the University of Pennsylvania, and obtained his orthopædic residency training at the Hospital for Joint Diseases in New York. Desiring even more advanced training, Dr. Frankel earned a Ph.D. in biomechanics and orthopædic surgery at the University of Uppsala under the tutelage of Professor Karl Hirsch. Upon his return from Sweden, Dr. Frankel joined the faculty at the Hospital for Joint Diseases, developing the biomechanics program there. In 1966 he moved to Case Western Reserve in Cleveland, and in 1974 advanced to the position of vice chairman of orthopædics. It was at Case that Dr. Frankel developed his great collaboration with Al Burstein, Ph.D. Their work resulted in such significant contributions as the Burstein-Frankel Torsional Testing Apparatus, the "telltale" nail, and the first organized approach to teaching biomechanics to orthopædic surgeons.

In 1976 Dr. Frankel was appointed chairman at the University of Washington upon the departure of D. Kay Clawson. With great success, Dr. Frankel set about the task of improving the relationships between the community orthopædic surgeons and the University, and establishing biomechanics laboratories at the UW and the VA Medical Center.

In 1981 an opportunity opened for Dr. Frankel to return to the Hospital for Joint Diseases, where today he is the chief executive officer as well as chair of the Department of Orthopædic Surgery. Under his direction, the hospital has increased its influence on the practice of orthopædics through its expanding clinical program and biomechanics laboratory.

Our Department is recognizing Dr. Frankel's continuing contributions with the establishment of the Victor H. Frankel Residency Research Award, which, beginning in 1990, will be awarded annually to the resident demonstrating excellence in orthopædic research.

Reflections from the Chair

My tenure as chair prompts many positive memories and a few negative ones. On the positive side, it is obvious that living in Seattle and the Northwest is the most sensible thing that an American can do. Although I left the region, all of my children remained in the Northwest. As a father I could do nothing finer than to give my children the opportunity of moving to this part of the country.

The UW is a scholarly university with first-rate research activities and a wonderful faculty. Although all programs now attract top medical students, such was not the case in the mid seventies. The applicants to the University of Washington program were outstanding and our residents at that time fulfilled all their early promise and have gone on to become successful practitioners in the community or in academic settings. The residents were not only scholars and good physicians, but wonderful people to be with. The young faculty was outstanding, and I was very fortunate in being able to promote their efforts to attain their orthopædic goals.

Research activities greatly increased during the late seventies, in particular the work of Dr. Burgess and the investigations in the area of occupational orthopædics. We instituted the largest study of back pain in industry ever conducted in the United States, and our experiences with the Boeing Company showed the usefulness of directly involving orthopædic surgeons in industrial and occupational research.

Among the great pluses of my tenure I also count the wonderful cooperation of the clinical faculty. Their support of my efforts as chairman was immense. To name only a few of these clinical faculty members would be unfair to all the others who were so helpful. However, it is imperative to recognize Dr. Ernest Burgess, at that time the most outstanding orthopædic surgeon in the Northwest, and also Dr. Park Gloyd, who served as chairman of the Clinical Faculty Committee.

The great negative during my tenure as chairman was the difficulty in retaining quality orthopædic surgeons. The loss from the full-time faculty of outstanding individuals such as Drs. Winquist, Chaplin, and Zorn, and later of trauma surgeons such as Dr. Veith, was a major problem. My chief, Dr. Joseph Milgram, always said to me that the hardest thing to find is "brains." To have "brains" and lose them is a shame.

Every chairman of the Department of Orthopædics brings his own personality, experience, and wisdom to the program and to the community. In the end, things are different and, it is hoped, better.

greater compensation and autonomy and so left the UW to enter private practice in 1982. Even though it was not in the School of Medicine's best interest, the University administration allowed him to continue as the football team's physician. Thus, the care of the varsity athletes, which the Department had provided beginning with Dr. Clawson and subsequently with Dr. Garrick, left the School of Medicine with Dr. Bramwell.

Again the Department faced the challenge of maintaining faculty against the economic lure of private practice, first manifest with the departure of Charles Andrews in 1960. In each case it seemed that the University had supported the development of an individual's clinical and teaching excellence, as well as a following of patients and referring physicians, only to lose the fruits of these investments. The "brain drain" continued as three more top faculty members left the Department to enter private practice including: Dave Chaplin, Dick Zorn, and Bob Winquist. Dr. Chaplin had developed a quality surgical arthritis program that spanned adult and pediatric arthritis. Dr. Zorn had provided excellent care for trauma patients and was a developing arthroscopist. Dr. Winquist had developed major expertise in closed femoral surgery, pelvic reconstruction, and other aspects of trauma surgery. Not only was he an excellent clinician, but he also was an excellent teacher, and in partnership with Ted Hansen developed an international reputation for trauma surgery. His departure, like the others, was a major loss to the Department. Dr. Winquist continues to be an active member of the clinical faculty as well as a major supporter of the Department's alumni activities and the Friends of Orthopædic Research and Education.

Early in 1981 Dr. Frankel himself left the Department of Orthopædics to return to the Hospital for Joint Diseases in New York, where he had done his residency training. He subsequently was appointed president of that institution and has led it back to financial health and international recognition. Long after his departure, Dr. Frankel's positive entrepreneurism continues to run strong in our Department.

The 1980s: Full Speed Ahead

By his own admission, Sigvard T. Hansen had no particular ambitions to be the chairman, but he did hold a strong desire to help the Department of Orthopædics maintain its excellence. After Frankel's departure the School of Medicine decided that Hansen's strength, the respect with which he was held by the faculty of all departments, the major leadership role he had played at Harborview Medical Center, and his understanding of the "system" made him an ideal choice for the chair. Breaking precedent, he became the first chairman to have his principal office at Harborview, symbolizing his commitment to that institution. Dr. Hansen applied his personal principles to his departmental administration as well as to his practice of orthopædics. They are: (1) Stick your neck out for what you believe in; (2) If it's worth doing, it's worth doing right; and (3) If it doesn't look good, it probably isn't.

Dr. Hansen set out to systematically strengthen the Department. He soon brought on board faculty members Roger Larson and Carol Teitz, whose clinical and research activities are noted in later sections of this book. Robert Veith, a traumatologist and an expert in foot and ankle reconstruction, joined the faculty in 1981.

These were banner years for the residency program. Our residents earned the top scores on the Orthopædic In-Training Examination and also demonstrated a high degree of clinical excellence. Research was proceeding well, including Dr. Greenlee's collagen investigations, Dr. Olerud's work in the ultrasonic assessment of wound healing, and Dr. Spengler's work in low back pain—all funded by the NIH. The Veterans Administration funded Lippert/Burgess studies of suspension of below-knee prostheses, Matsen's work on the use of transcutaneous PO_2 as a predictor of wound healing, Olerud's studies on microwounds in amputees, and Spengler's studies on in vivo stress and strain patterns.

Strengthening Basic Research

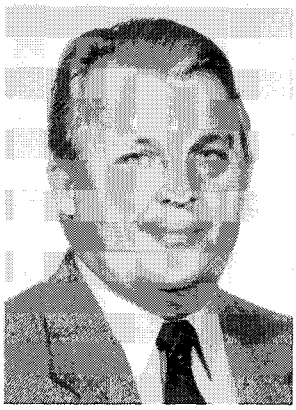
A major need that Dr. Hansen addressed during his tenure was the future of the basic science and research programs. In 1981 he organized a meeting at his home for senior faculty members and a number of friends of the Department, including Celeste Rogge. Out of these discussions evolved the concept of an endowed chair for orthopædic research. Dr. Hansen placed Dr. Matsen in charge of the fundraising campaign to establish an endowment that would enable the Department of Orthopædics to attract a world-class basic scientist. The goal was to resolve the problem experienced by Dr. Frankel in securing a tenured position for Dennis Carter. Interest from the endowment was dedicated to support the salary and benefits of the chair holder.

Mike Berry, retired president of Seafirst Bank and the father of resident Bob Berry, agreed to become the chairman of the campaign steering committee, which included clinical faculty members Ted Wagner, John Burns, Park Gloyd, Walter Krengel, Edwin Laurnen, and Martin Tullus. The generosity of Dr. Burgess, Bob Smith and other alumni, patients, local businesses, faculty, and the community enabled the Department to raise $1 million to endow the Ernest M. Burgess Chair for Orthopædic Research. To create a laboratory startup fund, the School of Medicine agreed to match the $185,000 that the Department produced from clinically generated revenue. Although reduction in interest rates have required substantial supplementation of the endowment income from clinically generated revenue, the chair program has been an outstanding success.

More than 60 candidates from all over the world were considered for this position, which was quite unique among orthopædic depart-

Sigvard T. Hansen, Jr., M.D.

Chairman, 1981-1985



1990 also marks the 25th anniversary of Dr. Ted Hansen's association with the Department. He entered the residency program in 1965 at the very time Orthopædics was elevated to the status of a department of the School of Medicine. A native of Spokane, Dr. Hansen graduated from Whitman College with a B.A. in biology. He earned his medical degree at the UW, and following an internship year at King County Hospital served three years as a senior medical officer in the Navy. Upon returning to the Northwest, he entered our residency program, graduating in 1969. Although Dr. Hansen spent more time on probation than any other resident in the program's history, his skills earned him an instructor position even before he completed his training. Dr. Hansen's outstanding talents as an innovative orthopædic traumatologist, teacher, and researcher quickly moved him up through the ranks. By 1973 he had been appointed Orthopædist-in-Chief at Harborview, by 1977 he had attained the rank of full professor, and in 1981 he was named Department chair.

Dr. Hansen has won international recognition for his clinical and research work on foot and ankle problems. Among his numerous professional responsibilities, he is a member of the boards of directors of AO International and the Laboratory for Experimental Surgery in Davos, is a founding member of the Orthopædic Trauma Association, and has played active leadership roles on several AAOS committees. In addition, he serves on several editorial boards, and is a consultant reviewer to the *Journal of Bone and Joint Surgery.* He is a widely sought-after lecturer and course instructor and has held numerous visiting professorships at institutions in the United States and abroad.

When Dr. Hansen stepped down from the chair in 1985, he left the Department of Orthopædics in an excellent position to enter the growth and development phase that we continue today. As chief of orthopædics at Harborview Dr. Hansen continues to serve as a guiding force on the faculty and an inspiring teacher for residents, fellows, and colleagues alike.

Reflections from the Chair

I took over the chairmanship of the Department of Orthopædics in a time of considerable turmoil. Although I had no real desire for the job, I could see the need for "inside" leadership at that time and felt that I could not refuse what amounted to a near "draft."

By the early 1980s our faculty was becoming widely known throughout the U.S. orthopædic scene with the emergence of Dr. Matsen in the area of shoulder and elbow surgery and compartment syndromes, Dr. Staheli as an international authority in pediatric orthopædics, Dr. Lippert as a national authority on orthopædic education, and the Harborview program as an internationally acclaimed center for the management of multiple systems trauma. It was a great source of pleasure to participate in this continued evolution of the University of Washington as a world-class program in so many areas of orthopædic surgery. A major low point for me was the the loss of Drs. Bach, Veith, Foster, and King in 1984. The inability to control the time requirements of patient flow and the resources to provide greater encouragement for these individuals was a tremendous frustration.

A major highlight of my tenure as chair was the opportunity to promote first-class basic research through establishment of an endowed chair named in honor of Dr. Ernest Burgess. The fundraising campaign led by Mike Berry, the just retired president of Seafirst Bank, benefitted the University in other ways, as many major leaders of the community were introduced for the first time to the dean of the School of Medicine and the president of the University. Dr. Matsen, in his highly organized fashion, took charge of the details of the campaign. With no history of failure in their backgrounds, Berry, Burgess, and Matsen soon made the Burgess Chair a reality. Bringing Dr. David Eyre to the UW was an outstanding decision that made my time and tribulations as chair very worthwhile.

After fulfilling the five-year commitment I had made to the Department and the School of Medicine, it was a great relief to resign the chairmanship in 1985. I was delighted that the dean and the very high-level search committee saw in Dr. Matsen the same qualities I had seen when I selected him as vice-chairman in 1981. He has been able, through his own skills and the momentum gained through the establishment of the Burgess Chair, to lead the Department into an unprecedented phase of growth and development. As for myself, I was very pleased to pass through the chairmanship phase of my career and return to my two first loves of patient care and teaching.

Ernest M. Burgess, M.D.

ments in the United States. After considering many outstanding candidates, the selection committee determined that David Eyre, an associate professor of biological chemistry in the Department of Orthopædic Surgery at Harvard Medical School and senior research assistant in orthopædic surgery at Boston Children's Hospital, was its first choice. Dr. Eyre was selected because of his energy, productivity, creativity, leadership, and importantly, because he had a unique talent for communicating the relevance of his research to practicing orthopædic surgeons. Dr. Eyre and his six-member research team joined the Department in 1985, setting up their research laboratories in the newly remodeled northwest corner of the tenth floor University offices. The Eyre team brought equipment and NIH grants for research on the chemistry of cartilage, collagen cross-linking, molecular polymorphism in bone and cartilage, the intervertebral disc, and the biochemistry and morphology of inborn skeletal diseases.

Departures and Arrivals

While outstanding progress was being made in the research dimension, the Department again was struck by the loss of key faculty members to private practice. Bob Foster left the Department to return to Colorado. Robert Veith joined former residents Henderson and Tullus in private practice in Renton, but remains an active supporter of the Department. Howard King established a solo practice in pediatric spine surgery, but continues to play a significant role in resident teaching at Children's Hospital. (He, Dr. Bigos, and former resident Craig Arntz conduct "Colmanesque" Friday morning Socratic sessions for the residents.) Al Bach joined the Seattle Hand Group, and continues as a very active member of the hand team, attending clinics and taking hand call at Harborview. These departures left Dr. Hansen as the only full-time traumatologist at Harborview at the time he was carrying major responsibilities as Department chair. The silver lining proved to be the support received from the group at Pacific Medical Center (John Clark, Keith Mayo, Jim Pritchett), and a number of high-quality trauma fellows such as Justin Lamont, Jack Wilbur, and Steve Benirschke. Paul Anderson also arrived in 1985 to work both as a general traumatologist and as an expert in spine trauma.

During this period the Department recruited Bill Lanzer, who is a mainstay of the adult reconstructive programs at the UW Medical Center and the VA Hospital, and John Sidles, a physicist trained at the University of Washington who has established a research team known as the Interactive Graphics for Orthopædic Surgeons (IGOS) group. Their activities, along with those of other current faculty members, are described in the section on The Department in 1990.

New Leadership

In mid decade, Orthopædics again experienced a shift in leadership. As he wrote in the 1985 annual report, Dr. Hansen came to the conclusion that he had had "all the fun I can stand," and resigned his chairmanship to return to his clinical practice and teaching. Dr. Hansen was destined, however, to become even busier as he took on a position with the Board of Directors of the AO Foundation, continued the directorship of the Orthopædic Service at Harborview, conducted a huge practice in foot and ankle surgery, took on several massive writing projects, and responded to countless invitations to serve as guest professor at institutions around the world. Dr. Hansen's commitment to excellence in clinical care remains strongly visible in the Department today.

Dr. Benjamin Belknap, associate dean of the School of Medicine, served as acting chair of Orthopædics during the nationwide search for a successor to Dr. Hansen. The Department will be in perpetual debt to Dr. Belknap for keeping us on an even keel during the interim. Charles Cummings of the Department of Otolaryngology headed the Search Committee composed of Stan Geyer, Ronald Lemire, David Morris, Albert Moss, Charles Rice, Peter Simkin, Carol Teitz, Theodore Wagner, and Richard Winn. In late 1985, after considering candidates such as Victor Goldberg of Case Western Reserve and John Frymoyer of the University of Vermont, the committee made a "home-field" choice with the selection of Rick Matsen to fill the Orthopædic chair.

The faculty members recruited to the Department over the first four years of Dr. Matsen's tenure have greatly strengthened our programs. The "Department in 1990" chapter to follow highlights their contributions. Faculty members joining the staff at Harborview have

Frederick A. Matsen III, M.D.

Chairman, 1986 to Present

A native of Austin, Texas, Frederick A. Matsen III did his undergraduate training at the University of Texas in Austin and earned his medical degree from Baylor University College of Medicine in 1968. After internship at Johns Hopkins in Baltimore, he was a fellow at the National Institute of Neurologic Disease and Stroke from 1969 to 1971, and then entered the orthopædic residency program at the University of Washington.

Dr. Matsen joined the University of Washington faculty in 1974. During Dr. Frankel's tenure as chair, Dr. Matsen directed the orthopædic residency program and was promoted to associate professor in 1979. Under Dr. Hansen's chairmanship, he was appointed vice chairman in 1981 and earned the rank of professor in 1982. This exponential promotion rate was supported by the universal recognition of Dr. Matsen's talents as a clinician, surgeon, basic researcher, clinical researcher, and teacher.

His clinical and research abilities won him wider national recognition with his election as a founding member of the American Shoulder and Elbow Surgeons, the winning of the prestigious AOA/ABC Traveling Fellowship in 1983, and election to the American Orthopædic Association in 1985. On the national level, Dr. Matsen also has served as Program Committee chairman for the AAOS Annual Meeting in 1988 and was elected president of the American Shoulder and Elbow Surgeons in 1989. Concurrent with these increasing administrative responsibilities, his clinical practice has evolved into one of the largest shoulder and elbow services in the United States.

Over the past dozen years Dr. Matsen's basic research interests have moved from compartmental syndromes, to transcutaneous oxygen measurement, into robotics, and finally into three-dimensional analysis of glenohumeral motion. Dr. Matsen's pioneering efforts to clarify compartmental syndromes resulted in the publication of a book of the same title in 1980. More recently, he has co-edited, with Charles Rockwood, the definitive work on the shoulder.

Dr. Matsen's brief tenure as chair of Orthopædics has produced unprecedented growth: the University of Washington is now the largest orthopædic service west of Rochester, Minnesota. The program has emerged as the outstanding residency in the United States, and it is widely believed that, under Dr. Matsen's leadership, the "best is yet to come."

Reflections from the Chair

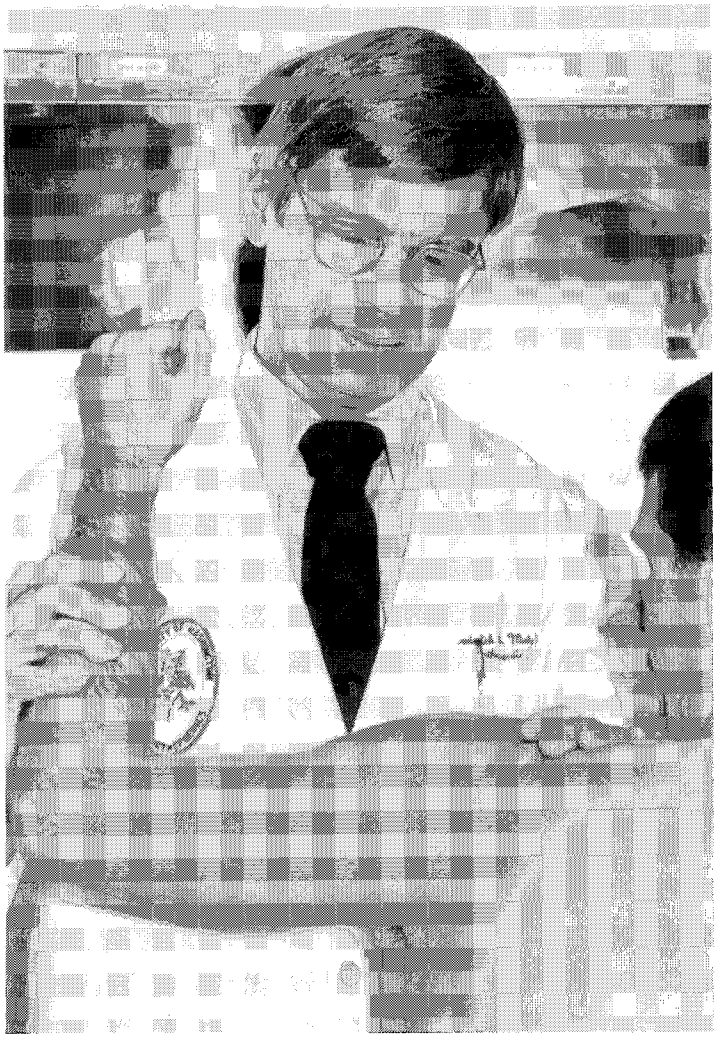
The Department is a team, a wonderfully complex organization of faculty, staff, administrators, residents, and students with countless internal and external relationships that are essential for its success. The strength of the Department, like the strength of a collagen molecule, is enhanced by the number of cross links where individuals derive substantial benefit by working with others on the team. Teamwork enables us to accomplish what individuals cannot do.

The Department must grow. To paraphrase Bob Dylan: a department that isn't busy being born, is busy dying. Growth in size enables us to achieve efficiencies of scale; growth in quality enables us to compete for resources and for opportunities at the local, national, and international levels. Growth takes place in different ways. Persistent adherence to a strategic plan for growth enables us to address our areas of relative weakness. We also grow by creative opportunism: this is a little bit like standing at an arcade shooting gallery, being ready to take advantage of any target that pops into view. Both methods of growth are serving us well.

The "coin of the realm" of the Department is its faculty. The faculty constitutes a totipotent group that can teach, do research, take care of patients, write, develop, and administer. A department with a quality faculty can do anything; a department without a quality faculty can do nothing. Thus, one of the primary activities of the Department of Orthopædics is faculty development. Our faculty is distinguished by their commitment to excellence in what they do ("Why be second rate?"), by their positive approach ("The glass is at least half full!"), and by their leadership ("Let me help get that done"). I am enthusiastic about the way the departmental team is growing. I am particularly proud of the many leaders emerging among our faculty.

included Steve Benirschke, Brad Henley, Keith Mayo, Chip Routt, and Bruce Sangeorzan. At the UW Medical Center the Department welcomed John Clark, Ernest U. (Chappie) Conrad, Douglas Harryman, and Tom Trumble. Joining Dr. Staheli at Children's Hospital were Vincent Mosca, Mark Dales, and Scott Hoffinger.

In 1988 Dr. Marc Swiontkowski, a graduate of our residency program, was recruited back to the Department from Vanderbilt University to serve as vice chairman and chief of orthopædic traumatology at Harborview Medical Center. Among his many accomplishments, he has established the Orthopædic Trauma Outcome Database at Harborview, and also led the planning effort for the D. Kay Clawson Library and the twenty-fifth anniversary celebration as well as this volume you are reading.



The years 1986-87 saw the establishment of the Friends of Orthopædic Research and Education (FORE). This organization recognizes the generous contributions of alumni, private individuals, patients, and corporations who support the Department's research and teaching activities. This support is vital in underwriting creative educational and research activities—programs that simply would not exist without such funding. FORE has provided support for an annual resident book and journal fund—dollars to help our residents keep up with the expanding amount of educational material in our growing speciality. The 1989-1990 campaign made possible the establishment of the D. Kay Clawson Library. Members of the Friends of Orthopædic Research and Education advisory board are Tom Green, David Loken, Ted Wagner, John Burns, Robert Winquist, and Park Gloyd, along with representatives of the full-time faculty and residents. A plaque displayed in the Bone and Joint Center at the University of Washington Medical Center recognizes the individual and corporate contributors to the FORE program.

This period also witnessed many other important events, such as the schoolwide recognition for the Musculoskeletal Core Course chaired by Dr. Carol Teitz, the resident OREF grant earned by Tim Lovell, and the establishment of a department-wide computer network to link the University, Harborview, Sports Medicine Clinic, and the Veteran's Administration offices. This key communication network was established through the perseverance of James Marcelle, the Department's information services coordinator.

Research endeavors took another major step forward in 1987 with the recruitment of Linda Sandell, Ph.D., formerly an assistant professor in the Departments of Orthopædics and Biochemistry at Rush Medical College. Dr. Sandell and her research group are committed to applying the principles and latest techniques of cell biology, molecular biology, and biochemistry to unravel the complex pathogenesis of such cartilage diseases as osteoarthritis and rheumatoid arthritis.

Another major step for departmental research evolved from the collaboration between the Department of Orthopædics, Harborview Medical Center, and the Center for Bioengineering (directed by Lee Huntsman, Ph.D.). Together, we were able to secure research space in Harborview Hall and a $220,000 grant from the Murdock Charitable Trust to establish the Orthopædics Biomechanics Laboratory. This facility enabled us to recruit an outstanding orthopædic bioengineer, Allan Tencer, Ph.D., from the University of Texas at Galveston to direct this laboratory. Immediately upon his arrival, Dr. Tencer set to work establishing collaborative research with the orthopædic surgical faculty, particularly at Harborview Medical Center, to help resolve some of the clinical problems encountered at the trauma center.

In an important new initiative launched in 1989, the Department decided to use some of its clinically-generated revenues to provide grants for pilot research by our orthopædic surgeon faculty. The purpose of this grant mechanism is to support preliminary studies paving

the way for future national funding in selected areas of investigation. In the first year of the program, three research awards were granted after a peer review of the submissions. Both Brad Henley and Allan Tencer will be supported for research in the role of fibular stabilization in fractures of the tibia. Bruce Sangeorzan and Allan Tencer will receive grant money for their work in load-bearing in the subtalar joint, and Paul Anderson and Allan Tencer will be supported for their work on the effect of topical fluoride on bone density. A Research Management Committee, chaired by Dr. Eyre, has recently been formed to enhance the effectiveness of departmental grants in furthering the investigative interests of the clinically active faculty and to review the large number of quality proposals submitted.

A Look Back: Significant Contributions

While it is difficult to single out and summarize the most important contributions made by this Department over its twenty-five years, some of the highlights merit recognition. In the dimension of clinical care, one of the standout achievements is the Department's initiative in the aggressive management of trauma. Ted Hansen and his colleagues have championed the concept that the traumatized patient is never more healthy than at the moment of the accident: a "golden hour" in which one can provide surgical care as if for a completely healthy individual. If this "golden" moment is missed the prognosis is less favorable. This philosophy has led our traumatologists to the concept of early and secure skeletal fixation of all fractures so that patients can be mobilized without the complications of prolonged bed rest. The result has been a dramatic improvement in the survival rates after major injuries and the speedier return of accident victims to their normal activities.

The studies led by Lynn Staheli in the natural history of torsional and foot problems in children are another major departmental contribution to the advancement of orthopædic knowledge. Dr. Staheli's observations that these "abnormalities" often correct themselves has led to the abandonment of previously popular but unnecessary modalities such as "orthopædic shoes," torque heels, medieval twister cables, night splints, and the like. The pediatric orthopædic service also has established the standard for dealing with congenital lesions, such as radial club hand, congenital dislocation of the elbow, arthrogryposis, and Kienbach's disease.

Led by Dr. Hansen, our Department is regarded as an international leader in the aggressive reconstruction of complex congenital, neurologic, and traumatic problems of the foot. Using such techniques as anatomic restoration of the bony anatomy and tendon transfers, our team has led the way for the restoration of function and comfort in standing and walking for many people across the country.

As noted in earlier pages, Drs. Burgess and Hansen have demonstrated that amputation is a reconstructive, rather than a destructive, procedure leading to the rapid restoration of function for those debilitated by injuries, vascular insufficiency, and non-healing wounds. With major advances in prosthetics, many individuals return not only to the basic activities of daily living, but also to sports such as snow skiing, water skiing, bicycling, basketball, and running.

Dr. Matsen, along with Drs. Mayo and Veith, has made major contributions to the understanding of compartmental syndromes. Interest in this area, originally stimulated by Dr. Clawson, continues as we try to understand the principles surrounding this potential source of loss of limb function. Our Department is credited with establishing the "unified concept" of compartmental syndromes, dramatically simplifying the understanding and management of the large group of conditions in which increased tissue pressure compromises the circulation and function of the contents of anatomic compartments.

In the puzzling dimension of low back pain, Dr. Bigos, initially in collaboration with Drs. Spengler and Nachemson, has led the way in realistic assessment of the factors determining the quality of outcome after low back injuries. The Bigos team has cast a new reality on the management of low back pain and introduced predictors of the outcome of surgical treatment.

Our Sports Medicine Service has made major contributions in the area of anterior cruciate ligament injuries. Dr. Teitz has demonstrated the ineffectiveness of braces in preventing these injuries, while Drs. Larson and Sidles have pioneered new techniques for treatment of these common and devastating injuries.

The shoulder and elbow service has become well known for its contribution in the area of the diagnosis and treatment of rotator cuff tears, glenohumeral instability and degenerative conditions of the shoulder and elbow joints. As the national champion of shoulder sonography, the UW has made major contributions to the understanding rotator cuff fiber failure. A surgeon-friendly shoulder outcome data base and a sophisticated shoulder motion analysis system are other major contributions of this team.

In that our research success stories are ongoing, many are described in the next section: The Department in 1990. This chapter focuses in more depth on our programs today as we are poised to begin a new decade and to launch our next quarter century.

Tales of the Nails

This volume would not be complete without a description of the beginnings and development of closed intramedullary nailing at the University of Washington. The technique was introduced at the UW in the spring of 1966 by Gerhard Küntscher of Germany, who had developed closed intramedullary nailing in the 1940s.

At the time of Dr. Küntscher's visit, most fractures of the femur seen at the University of Washington were treated with six to eight weeks of traction, followed by the application of a walking spica cast and approximately six months of total immobilization. Dr. Clawson was a traditionalist who wanted to teach the residents solid techniques, but he also was very interested in the benefits of early mobilization, and Dr. Küntscher's ideas and techniques had aroused his interest. However, since the faculty believed in the advantages of balanced and fixed traction for femoral fractures, Dr. Clawson bided his time. He ordered all the Küntscher equipment: the Maquet table, the Ossimat power source, the Sieman's C-arm, the reamers, the reamer guides, the trochanteric broach, the nails, and the nail guides. He even included the Küntscher distractor, a large U-bolt with a tensioned K-wire device that Roger Anderson would have envied. With this equipment in place, all that was needed was someone who knew how to use it.

Dr. Clawson recognized that the best way to learn a new technique was to work directly with the master, but none of the full-time faculty had the time or the funding to study with Professor Küntscher in Germany. In the spring of 1967 Robert Smith, who was completing his year as chief resident at Harborview Hospital, and who was assigned for a final six months as chief resident at the University Hospital, volunteered to spend six weeks in Flensburg using money from a bank loan, as long as Dr. Clawson did not count him absent from work at the University Hospital. Six weeks of observing the forthright professor, his associates, and their practice of intramedullary nailing established Dr. Smith's confidence in the technique: Professor Küntscher's results were as good as his claims.

After he returned to Seattle, Dr. Smith trained Ivory Larry, P.A., who had become proficient in the use of the C-arm, to be his assistant, and Dr. Smith performed six or eight closed intramedullary

nailings before graduating in December 1967. The first closed IM nailing was performed on a twenty-year-old zoo keeper who had sustained a femoral fracture in an automobile accident. She had been in traction for three months with no evidence of bone union, but after placement of a 16-millimeter nail the fracture healed.

Shortly after Dr. Smith entered private practice in January 1968, Sigvard Hansen returned from Spokane, where he had been hiding from the faculty for a year at the Shriners Hospital after being put on probation in Seattle. As he began his chief resident rotation at the University Hospital, Dr. Hansen became intrigued with intramedullary nailing. Bob Smith passed the torch on to him and returned to help with four or five nailings. However, Dr. Hansen learned the technique primarily from Ivory Larry, who knew how to set up the table and position the patient, how to set and run the image intensifier, and how to manipulate the leg. The rest, of course, was not all that difficult.

The technique used was exactly as Dr. Smith had learned it from Dr. Küntscher, although today we recognize that this protocol was a little primitive. Prior to the nailing, the patient spent at least a week on the ward in a distraction device undergoing a form of German torture. To establish traction a long K-wire was inserted through the pelvis just under the anterior iliac spine, and a second K-wire was placed through the distal femur; the U-bolt traction device was then attached to the K-wires. The femur was held at length or slightly distracted until the initial hemorrhage and swelling had resolved and the muscles were adequately weakened—or until the patient begged to go to the operating room. When intramedullary nailing was finally performed, the patient was positioned on the operating table with the Küntscher distractor in place, and after 17 to 18 millimeters of bone had been reamed, a straight nail was inserted through a starting point in the tip of the trochanter.

This protocol worked relatively well and was used for all intramedullary nailing cases until October 1968, when a milestone patient appeared on University Hospital's doorstep. A seventeen-year-old student and cheerleader from Edmonds had been injured in a head-on automobile collision after a football game. She was transported to University Hospital by an ambulance driver who thought she was dead on arrival at the emergency room. She had a severe head injury and a proximal-third fracture of the femur with a large butterfly fragment and, indeed, she was not breathing when she was retrieved from the ambulance.

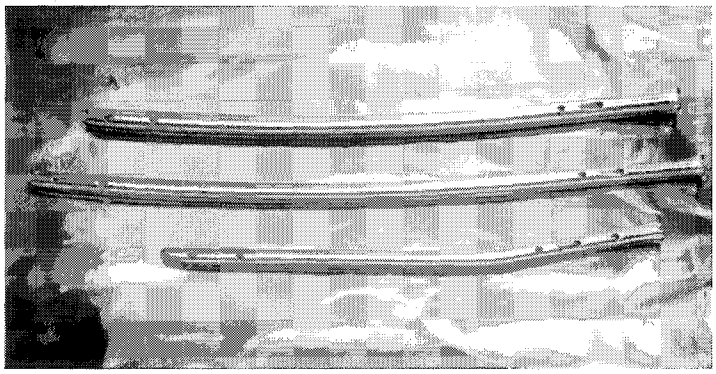
The neurosurgeons quickly established an airway and took her to the operating room, where they decompressed her head. She was then taken to the neurosurgical ICU, a tracheostomy was performed, and her leg was placed in balanced traction. Her orthopædic attending was Dr. T.K.F. Taylor and the chief resident was Dr. Hansen. When the IM nailing concept was first introduced, Dr. Taylor, a staunch proponent of fixed traction, is remembered for stating: "I would rather crawl five miles on my hands and knees over broken glass than have my fractured femur treated with intramedullary nailing."

Approximately one week after injury the young woman was still comatose and febrile, had pus exuding from her tracheostomy site, and had flexor spasms of her thigh where the proximal end of the femur was threatening to penetrate the anterior skin. Dr. Hansen, in all his wisdom and experience, thought this would be a good time to perform a closed nailing of her femur. Dr. Taylor considered this line of thought tantamount to another probation. Instead of objecting, however, Dr. Taylor asked only that he not be told about the operation. How Hansen convinced the anesthesiologist to put this patient to sleep, or the neurosurgeons to agree to surgery in light of her grievous condition, is not clear. No doubt an important factor in their willingness to consent was that they did not think the patient would live. Two days after the nailing the patient stopped thrashing and was able to sit up and open her eyes; even her pneumonia began resolving. Her parents were convinced that nailing her femur had cleared up her head injury, and everyone remarked over how unsophisticated and gullible this couple was. Nevertheless, they took their daughter home and she graduated from high school, went on to college, married, and had children.

One early patient who left vivid impressions on the IM team was a 300-pound exotic dancer who performed with a boa constrictor. Having sustained a fairly distal femoral fracture, she was escorted to University Hospital, in traction, by two Group Health Hospital attendings. During closed nailing, the nail passed through the anterior cortex and back into the distal fragment, as the nail did not match the bow of the femur. Nevertheless, the patient returned to "excellent function." Another memorable patient was an eighteen-year-old woman treated in traction for eight weeks with no evidence of bone healing after Dr. Fry, still resistant to the idea of nailing, had plated her fractured femur. After the limb ended up in 80 degrees of internal rotation, the plate was removed, nailing was performed, and the femur went on to union. This experience converted Dr. Fry, who apparently was one of the last faculty members to jump onto the IM nailing bandwagon.

Dr. Hansen began his chief resident rotation at Harborview in January 1969, and occasionally took patients back to the University Hospital for closed IM nailings. Dr. Donald Gunn, Harborview's orthopædist-in-chief, asked Hansen to stay on after graduation to teach IM nailing to the residents, since no once else knew the technique. In 1970, while on a pediatric fellowship in England, Dr. Hansen visited Professor Küntscher and the AO group before returning to Seattle in the fall. Hansen ordered more Küntscher equipment so that by 1972 IM nailings could be performed at both Harborview and the University Hospital.

Ivory Larry recalls that in the early days of IM nailing the average operating time was ninety minutes, and reaming was excessive. When



trouble arose with the Ossimat reamer, Mr. Larry and Dr. Hansen could determine from the sound of the machine which part of the reamer system had broken or become detached, a frequent occurrence. The five-minute C-arm alarm often sounded up to six times during these procedures. Not surprisingly, mishaps occurred. Dr. Smith acquired his "Captain Crunch" label after producing a distal humerus fracture by gently "tapping" the nail to send it home during the nailing of a humerus. Back then the surgeons had a tendency to keep an eye on the fracture site and did not watch proximally or distally during nail insertion. This situation led to another well-remembered incident, wherein Dr. William Thieme drove a nail through the distal femur and into the knee joint. Reamers also were famous for ripping off gloves, an event that became known as "the Lester maneuver."

For the above noted reasons, the attendings in the community remained skeptical about the procedure, and some referring physicians admitted to a faint hope that it would fail. To the contrary, it proved to be an ideal technique for teaching residents, who could operate the reamer and do the nailing, while a more experienced surgeon did the reduction and assisted with the Maquet table, which, Dr. Küntscher once kindly remarked, "almost prevents intramedullary nailing." As more nailings were performed, it became increasingly evident that the original Küntscher technique could be improved in several ways. Dr. Hansen began bending the nails to conform with the normal anterior curve of the femur. The fact that Harborview lacked the proper equipment to alter the nails was no obstacle, as ingenuity came to the rescue. The cast room of the old operating room on the seventh floor was equipped with very sturdy drain pipes under the plaster trap. Two pipes were located at exactly the right distance from one another to bend a nail between its middle and distal third and its middle and proximal third. Hansen would first "eyeball" the amount of femoral bow, then take the nail and either bend it over his knee or place it behind the pipes and pull until the nail was "bent to suit." In another improvement, Dr. Robert Winquist, then a resident, suggested moving the insertion point in the trochanteric tip to a point inside the tip and a little posterior. These modifications, along with less vigorous reaming, made nailing easier and caused fewer complications.

In those days, the early mobilization afforded by IM nailing brought some surprises to the hospital staff, who were accustomed to a long recovery period for patients with a femoral fracture. Jail patients were often treated at Harborview, and sheriffs assumed that their prisoners with this injury did not have to be constantly watched. Security became lax for one jail patient who had undergone an IM nailing. The sheriff guarding him left the room for a few minutes and came back to find the hospital bed empty. Looking out the window, he saw the patient running up Alder Street. In an ironic end to this story, three months later the patient stole a car and was slightly injured in an automobile accident. Preliminary examination in the Harborview emergency room revealed sutures in the patient's buttock, and X-ray examination showed an IM nail in the well-healed femur. The patient soon faced a different kind of metal bars.

Dr. Küntscher had developed a very simple, but not very effective, closed intramedullary saw for femoral osteotomies. This circular saw at the end of a long, thin, flexible shaft could be used with a guide. The shaft could be bent into an "S" shape near the upper end and attached to a rotary power source. Dr. Hansen used the saw in four or five cases for shortening and rotational deformities, but not without encountering many technical difficulties. Necessity prompted the development of a better saw. In 1972 Dr. Winquist's aunt asked him to treat her nonunited femur, which had been managed with open IM nailing. A large and relatively stable fibrous nonunion had formed over the broken 10-millimeter nail. Mrs. Winquist suggested a friend who might help design the device needed to remove the broken nail—Ray Pearson, a senior engineer at Boeing in charge of the just-completed SST project. Pearson indeed designed an excellent device that allowed removal of the nail.

Impressed, Dr. Hansen invited Pearson to watch a closed osteotomy with the Küntscher saw, hoping he might help develop a better one. Appalled, not only by the intramedullary saw but by the quality of all the instruments, Pearson set to work designing a saw with two blades. After undergoing some refinements and modifications with the assistance of Dr. Winquist, the saw was used very successfully for several years. Orthopedic Equipment Company eventually received the manufacturing rights and produced a very good commercial saw that is now widely used.

In 1973 Dr. Hansen became the orthopædist-in-chief at Harborview after Dr. Gunn left the University for private practice. Without approval of the Management Committee, Hansen started inviting local orthopædists to bring their patients to Harborview to perform IM nailings with the Harborview staff present. Former UW residents and many young orthopædists new to the community took advantage of this opportunity. The IM nailing technique spread rapidly

throughout the area, and the number of cases in the Harborview series multiplied very quickly.

In early 1975 Hansen invited Winquist, who had just finished his residency, to join the faculty as the second full-time orthopædist at Harborview. The protocol at that time required either Dr. Hansen or Dr. Winquist to be present at all nailings so as to stabilize and refine the technique. Dr. Winquist reviewed the first 300 closed intramedullary nailings done at Harborview, a project begun during his residency, and presented his paper at the Combined Meeting of the English-Speaking World in London in 1976. He described the University of Washington modifications to the original Küntscher technique and showed that the infection rate could be lowered to less than one percent, that malunions were very uncommon, and that the rate of nonunion was less than half of one percent. Although the paper was very well received, few orthopædists put the revised techniques into practice.

The number of severely injured patients brought to Harborview increased rapidly in the late 1970s as the hospital developed into a major trauma center and paramedics triaged patients there. More modifications and discoveries followed, including the determination that open femoral fractures could be nailed safely. For several years, open femurs were initially debrided, delayed closure was performed after about five days, and the femur was nailed approximately ten days after injury. However, the Harborview team discovered that when open fractures, even Grades II and III, were nailed immediately, infection rates did not rise significantly and patients experienced major benefits. In the late 1970s the protocol of internal fixation at Harborview was changed to require that all open or severe fractures in multiply injured patients be treated with immediate internal fixation. Although initially highly controversial, this practice, as with intramedullary nailing, gradually spread to other trauma centers around the United States. By 1985 immediate internal fixation of open fractures had become standard protocol in all major trauma centers.

This story would be remiss not to mention the major contribution made by the Department of Anesthesiology. In the early years Dr. William G. Horton, a board-certified surgeon and anesthesiologist in charge of the ICU at Harborview, became convinced that very early and aggressive management of fractures benefitted patients, and he influenced the Anesthesiology Department to go along with IM nailing in the severely injured. Dr. Ed Charlton best expressed this support, stating that "he would not only put to sleep any patients on whom the orthopædists were willing to operate, but he would also wake them up again." He was always as good as his word.

The Harborview staff wrote many papers about intramedullary nailing during the seventies, but the most momentous presentation on the topic occurred at the 1982 AAOS Meeting when Dr. Winquist discussed the results of 520 cases of femoral nailing in the University of Washington/Harborview series. The presentation was scheduled for a very prestigious time slot, just before the president's guest speaker. Augusto Sarmiento, who had popularized cast bracing for femoral fractures during the same years in which Harborview had progressed with IM nailing, and who had many advocates, was to discuss the paper. Dr. Sarmiento had delivered the LeCocq Lecture at the University in 1980 and was aware of the IM nailing results from his own observations at Harborview. A huge audience gathered, expecting a major confrontation. After Dr. Winquist finished his presentation, Dr. Sarmineto announced: "This is the best paper to be presented at the Academy in ten years." The audience was taken completely by surprise, and Dr. Sarmiento's discussion ushered closed intramedullary nailing into respectability. The work done at Harborview has subsequently been repeated and verified at many other centers.

Although Dr. Winquist left the faculty for private practice in the early 1980s, he continued to contribute unique papers on IM nailing and femoral fractures; these included a classification of comminution and the identification of indications for use of the recently introduced interlocking nails. Other Harborview faculty who have contributed major papers over the years include Rob Veith, Al Bach, Bob Foster, Dick Zorn, and more recently, Marc Swiontkowski, Keith Mayo, Brad Henley, and Steve Benirschke. Since 1972 faculty and former faculty have presented and chaired numerous Instructional Course lectures on IM nailing at the Academy meetings. An advanced course, chaired by Dr. Winquist and taught by UW faculty and residency program graduates, was recently added to the course offerings.

Stabilization of the femur remains the single most beneficial orthopædic procedure to improve the general welfare of a multiply injured patient. We now know that the "naive" observations made by the young cheerleader's parents in 1968 were absolutely correct. Intramedullary nailing is extremely beneficial in preventing or treating pulmonary problems, including pneumonia and adult respiratory distress syndrome, and in alleviating the sequelae of head injuries. When a patient is able to sit up rather than lie flat in traction, oxygen intake is improved and intracranial pressure is lowered.

New developments in intramedullary nailing today include locked nails for femoral fractures and nonreamed locked nails for open tibial fractures. These new devices show promise for replacing many of the complicated external fixators now used for open fractures of the tibia. The Department of Orthopædics remains at the forefront in developing improved techniques for IM nailing, maintaining the tradition of innovation and leadership established more than twenty years ago.

Our Present
The Department in 1990

At the 25-year mark, the Department of Orthopædics has matured to a level of excellence that ranks it among the best in the nation. The Department embarks upon its second quarter-century with outstanding programs on three fronts: research, clinical, and educational.

RESEARCH
Connective Tissue Biochemistry Laboratories

The Department's basic scientists are exploring the fundamental biochemistry of articular cartilage and the changes that occur in osteoarthritis, the basic biological properties of the intervertebral disk, and the molecular lesions that underlie heritable diseases that affect the development and structure of bone and cartilage. Knowledge gained in these endeavors will lead to advances in diagnosis and treatment for a wide array of musculoskeletal disorders.

Directing the research effort is Dr. David Eyre, the first holder of the Ernest M. Burgess Endowed Chair of Orthopædic Research. Over the past five years, the Eyre research team, now eight-persons strong, has made notable discoveries regarding the role of type IX collagen in cartilage. This work will continue with the award in 1989 of five-year renewals for two NIH grants, one on intervertebral disk biochemistry and the other on the inborn skeletal diseases.

A spin-off from this basic research is a new area of investigation — the development of molecular markers for assessing bone resorption and cartilage degradation. A three-year grant from Ostex International, a new Seattle biotechnology company, has launched the exploration of novel collagen metabolites in urine and other body fluids for possible quantitative measures of human bone resorption and joint cartilage degradation. This project expands the basic activities of the laboratory and is an example of the type of academic/industrial partnership that will foster the future growth of biomedical research as federal support dollars become scarcer.

At the Veterans Administration Hospital, Dr. Linda Sandell's research laboratory is conducting studies to gain a better understanding of the metabolism of chondrocytes, the cellular building blocks of cartilage. Her research team is specifically interested in the factors that regulate production of cartilage matrix and in the ability of cartilage to repair itself.

Cartilage and bone require the production of specific types of extracellular matrices whose properties are largely determined by the major macromolecules of the tissue: collagen, proteoglycans, and link proteins. Deficiencies, abnormal production, or changes in the genetic type of these macromolecules are associated with osteoarthritis, rheumatoid arthritis, diabetes, and inherited connective tissue abnormalities. Using techniques of cell culture, histology, biochemistry, and molecular biology, the team is investigating the factors that affect the synthesis and regulation of the extracellular matrix. To this end, the team has extensively analyzed the cartilage collagen gene and the basic mechanisms of biosynthesis of collagens and proteoglycans. This research is showing that chondrocytes react to factors present in arthritis such as interleukin I and interferon by decreasing the synthesis of structural matrix molecules and increasing the synthesis of degradative enzymes, consequently leading to cartilage breakdown. Conversely, certain other factors increase matrix synthesis and may be useful in reversing the degradative process. Future studies will aim to enhance understanding of the mechanisms

of chondrocyte response, leading eventually to therapies directed toward the repair of cartilage tissue.

In addition to her highly successful record in securing NIH grants, Dr. Sandell recently received an Associate Investigator Award from the Veterans Administration. This prestigious award (only the second in any field at the Seattle VA Hospital) provides five years of research support for Dr. Sandell.

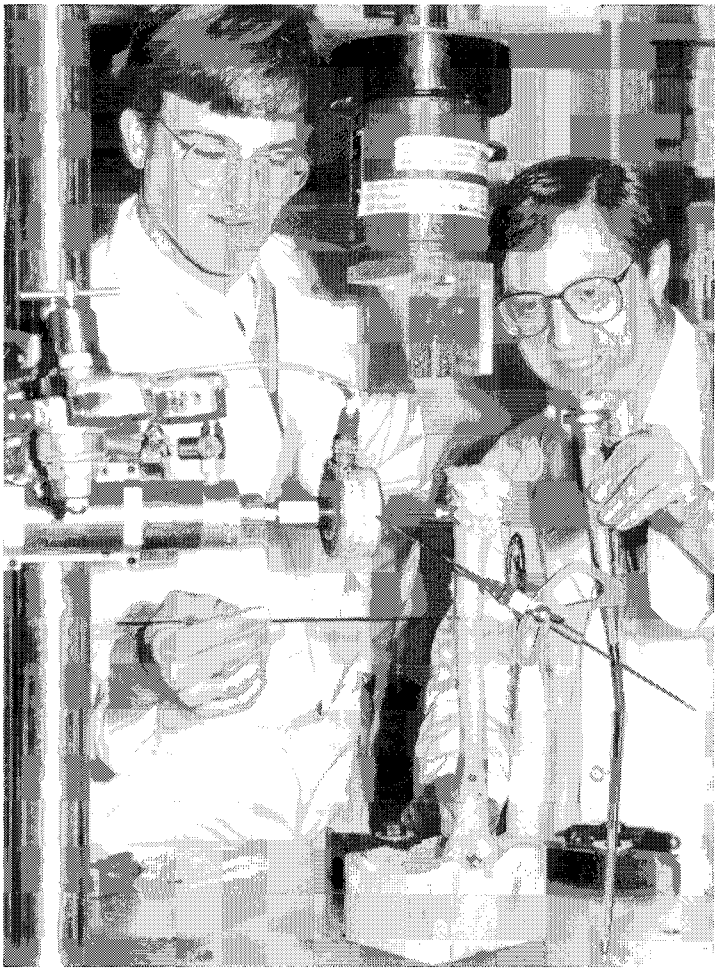
Biomechanics Laboratory

Under the direction of Dr. Allan Tencer, the Orthopædic Biomechanics Laboratory at Harborview Medical Center is engaged in some dozen ongoing research projects that will advance our knowledge base regarding the properties of bone and associated musculoskeletal tissue. Opened in July 1988, the 1,600-square-foot space in the basement of Harborview Hall contains a histomorphology laboratory, a main laboratory, a machine shop, and offices.

The laboratory has state-of-the-art equipment for experimental orthopædic biomechanics, much of it specially designed and built on-site in the machine shop. A servo-hydraulic materials testing system permits three-axis cyclic loading of specimens with independent control of each channel. A second, screw-driven mechanical tester is available for single-axis loading experiments. Custom-loading jigs have been fabricated for loading of humerus, tibia, wrist, foot, and spine specimens.

In the biomechanics lab, Dr. Bruce Sangeorzan is working with Richard Harrington, a research engineer, on the biomechanics of the hindfoot to evaluate reconstruction techniques. Drs. Al Bach and Tom Trumble are engaged in ongoing research projects to compare methods of limited carpal fusion in the wrist and to define the roles of the small intercarpal ligaments to aid in strategies of reconstruction. Dr. Paul Anderson directs a project on the biomechanics of indirect reduction of bone protruding into the canal after vertebral fracture. He also is investigating the residual mechanical stability produced by incomplete spinal fractures. Dr. Brad Henley is investigating fixation methods for humeral and tibial fractures.

Drs. Anderson and Tencer are studying the properties of systems for the controlled release of bone growth stimulating factors, particularly sodium fluoride. Dr. Steve Benirschke is directing two projects involving the noninvasive assessment of fracture healing, one using vibrational excitation of the healing bone and the other by instrumentation of external fixation. Dr. Peter Simkin (of Rheumatology) is involved in an investigation of the role of marrow contents on the mechanical properties of bone in dynamic loading. In collaboration with industry, Dr. Tencer also is overseeing projects evaluating new methods of fracture fixation for the lumbosacral spine and tibia. A large number of students are involved in these research projects,



including graduate students from the Department of Mechanical Engineering, the Center for Bioengineering, and the School of Medicine. The laboratory also has facilities for biologically oriented measurements including laser Doppler blood flow, microradiography, quantitative histomorphometry, and fluorescence microscopy. Dr. Marc Swiontkowski directs studies on the measurement of blood flow under fixation plates and the role of angiogenic factors in fracture healing.

The Biomechanics Laboratory has defined four areas of future investigation based on the experience and interests of the Department's investigators as well as the potential for making original contributions to the field. Basic research will continue on the biomechanics of the foot, wrist, and spine, building upon projects already in progress. In step with Harborview's role as a major trauma center, the laboratory will continue to test and evaluate new methods

of fracture fixation. Knowledge gained in the area of controlled-release biodegradable polymers will permit the ongoing development of methods to stimulate local bone formation through the local delivery of bone forming agents such as sodium fluoride and specific growth factors. Finally, the lab will continue to apply the exciting and versatile technology of laser Doppler flowmetry.

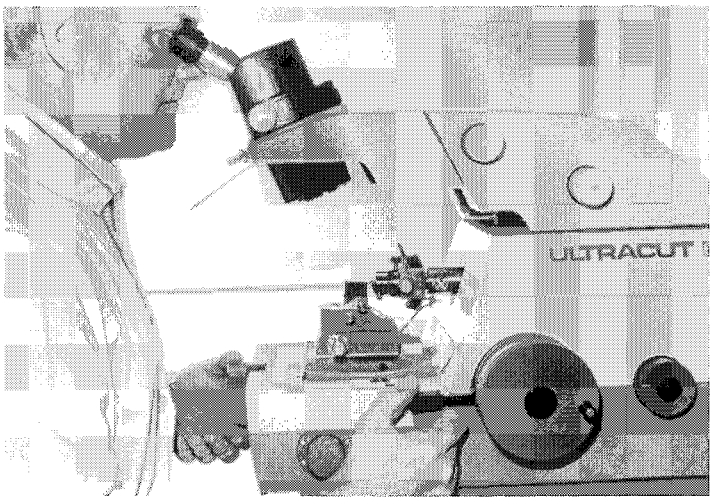
Morphology Laboratory

Approximately three years ago the Department began to build a musculoskeletal morphology unit under the direction of Dr. John Clark. BRSG and OREF grants permitted the purchase of high-quality light microscopes. A major step toward establishment of a full-fledged lab occurred with the hiring of Jim Huber, a research technician skilled in microscopy and photography. When Dr. Allan Tencer arrived in 1988, the Biomechanics Lab added fluorescence microscopy and image analysis to the lab's capacities. The Morphology Lab has steadily added equipment such as a diamond saw and various microtomes, and Dr. Tom Trumble has used an OREF grant to provide a cryostat and an ultramicrotome. The lab is now capable of preparing material for conventional light microscopy, polarized light microscopy, scanning electron microscopy, and transmission electron microscopy.

In this lab Dr. Clark is investigating the structure of collagen in articular cartilage, challenging traditional models of joint structure. Dr. Tom Trumble is conducting studies on nerve transplantation, growth factors, and blood flow, attempting to develop better approaches for managing clinical nerve deficiences. Dr. John Sidles is using new freeze-fixation techniques to examine the morphology of tissues under load, with particular reference to the normal and reconstructed anterior cruciate ligament. These studies are helping us understand why the normal ACL is so strong and why grafts fail.

Studies on Back Pain among Industrial Workers

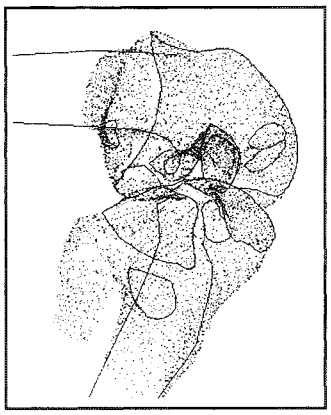
Back problems represent one of the most expensive components of the health care "pie" for the industrialized nations of the world — not only in direct medical costs but in time lost from work and consequent impacts on production. Back problems are not as unidimensional as once thought, and problems experienced by employees in industry cannot be attributed solely to on-the-job "injuries." Many workers who report back symptoms are unable to clearly describe an associated incident or injury. To investigate some of the unanswered questions about this common and often disabling musculoskeletal malady, investigators from the Departments of Orthopædics, Occupational Medicine, and Biostatistics in 1983 launched the world's largest study of the factors related to back problems among



industrial workers. For the past six years the study has been directed by Dr. Stanley Bigos with the collaboration of Dr. Michele Battié.

Phase one of the study focused on a retrospective evaluation of back injury reports over a 15-month period in a study population of 31,200 Boeing Company blue-collar employees. Phase two is further examining the role of physical and nonphysical factors in the report of back problems in a prospective study of 3,020 hourly Boeing Company employees. Published reports of this research have gained worldwide recognition.

Mechanics and Interactive Computer Graphics



John Sidles has established a multidimensional research laboratory using techniques ranging from shoulder mechanics to robots. Using sophisticated computer techniques, Dr. Sidles has developed the "Orthokine" system to monitor the details of joint rotations and translations. Using this technology, Doug Harryman and John Sidles have been able to demonstrate that the shoulder does not function as a strict ball-and-socket joint, but rather that its movements are substantially more complex (a reminder of a realization of similar import: that the knee does not function as a hinge). This research team also has explored the function of the previously engima-

tic coracohumeral ligament, and has launched a study of movements of living shoulders. In this research, data is collected by pinning motion sensors to the arms of "volunteers" and investigating the relative motions at the glenohumeral and scapulothoracic joints. These studies have led to a new understanding of the complex interrelationship between these two articulations.

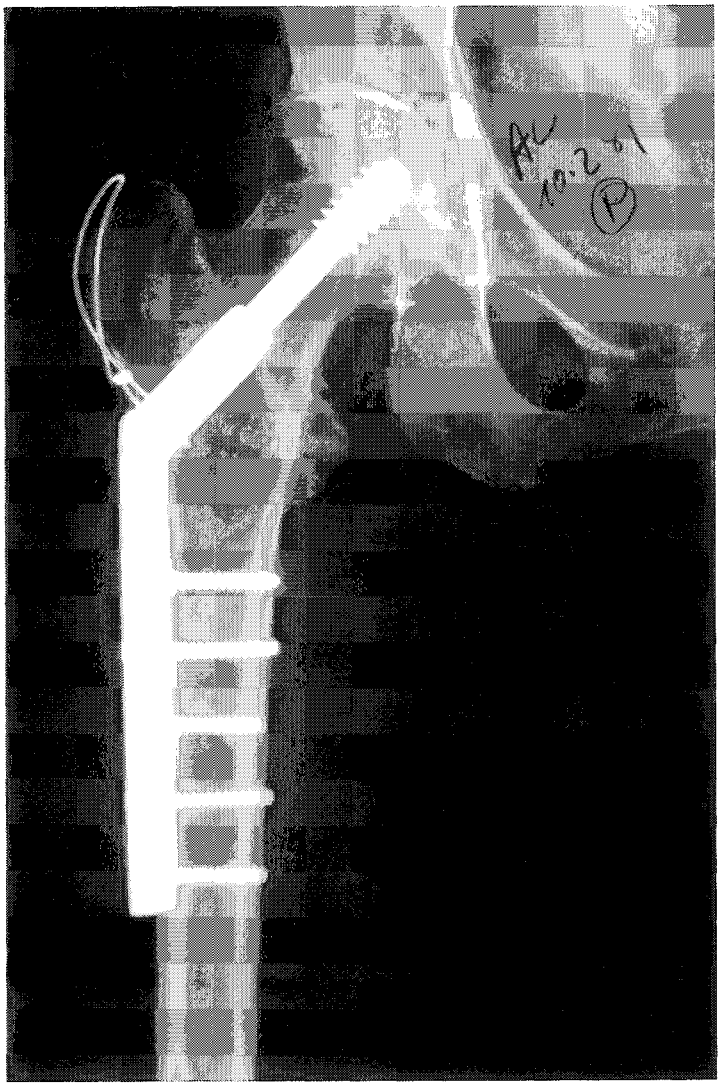
With Joe Garbini from Mechanical Engineering, Dr. Sidles has completed the development of a precision motion control device (robot) for use as an orthopædic assistant in the operating room. This system provides assistance in planning and conducting a total knee replacement. Another exciting research development has resulted from the collaboration between Dr. Sidles' laboratory and Dr. Burgess' Prosthetics Research Study (PRS) team. This group has established a practical method for the computer-assisted design and manufacture of artificial limbs. The team takes numerical data from the surface of the residual limb, rectifies the information according to the rules used by prosthetists, and produces a wearable limb — all in one sitting. At present the team provides artificial limbs for amputees in the United States as well as in Vietnam, Afghanistan, and the Soviet Union.

CLINICAL PROGRAMS
University of Washington Medical Center

Bone and Joint Center

The concept for the Bone and Joint Center, established in 1988, grew out of the Department's desire to provide preplanned, integrated, and definitive evaluations for patients and referring physicians from throughout the Northwest. At the core of the Bone and Joint Center is a multidisciplinary team of orthopædic surgeons, rheumatologists, radiologists, specialists in metabolic bone disease, nurses, therapists, physicians' assistants, patient care coordinators, and other specialists dedicated to the concept of excellence in evaluation and management of patients with bone and joint problems. The Bone and Joint Center provides specialists in the entire range of musculoskeletal problems ranging from hand to foot, hip, shoulder, and spine, to fractures, tumors, transplantation, and sports medicine. The Bone and Joint Center has become a regional resource, providing service to patients and physicians from Alaska, Idaho, Montana, Oregon, and Northern California.

The faculty members of the Department of Orthopædics form the surgical team of the Bone and Joint Center. They are joined by Dr. Greg Gardner, a rheumatologist who links the Center with the Division of Rheumatology of the Department of Medicine. Expertise in metabolic bone disease is provided by Drs. Charles Chesnut and Susan Ott of the Department of Medicine. Dr. Mike Richardson is the Center's principal radiologist, joined by Drs. Larry Mack and



Keith Wang, bone and joint sonographers. Physical therapy is provided by the Department of Physical Medicine and Rehabilitation under the leadership of Sarah Jackins and Anne Jamieson. Outpatient nursing is headed by Marietta Weber and inpatient nursing by Sandy Piscitello. The physicians' assistant program is ably served by Ivory Larry, Katie Curtis, and Elizabeth Crouch. The Center's patient care coordinators are Diane Maguire and Barb Pentilla, who are at the core of our efforts to serve our patients and referring physicians. These individuals and all the members of the Bone and Joint Center team endeavor to work together to provide the best possible evaluation and treatment for our patients, and expert consultations to their referring physicians.

Spine Resource Clinic

The Spine Resource Clinic was founded in August 1985 as a clinical expansion of the research under way on back problems in industry. The goal of the SRC is to seek reasons for the delayed recovery from the "back and neck symptom" phenomenon, to provide effective physical treatment, and to tackle some of the problems that have made back pain such a nemesis to the industrialized nations of the world. A major purpose is to serve as an interface between medical profession, industry, and labor to provide proven, effective treatment methods (both surgical and nonsurgical) to prevent people from becoming disabled by back symptoms.

The SRC was founded and is directed by Dr. Stanley J. Bigos, the principal investigator on the Boeing study of back pain in industry. The associate director is Michele Battié, Ph.D., a co-investigator on the Boeing study who is active in improving patient education and helping individuals prepare to resume their previous job activities or to seek new occupations if their current job is too physically demanding. Dr. John Holland, a physician with experience in occupational medicine, shares the medical directorship with Dr. Mark Tomski of the Department of Rehabilitation Medicine. Other members of the SRC staff include physician's assistant Jim Stewart and program assistant May Nystrom. The clinic is located in the Hec Edmundson Pavilion along with the Sports Medicine Clinic.

Clinical research focuses on evaluation of indications for surgery and criteria for successful surgical outcome in industrial workers with low back pain. In addition, investigators are studying the effects of an individual's perceptions of job and life requirements as they relate to treatment outcome. Future goals of the SRC are to further delineate the most appropriate interventions for patients' medical and surgical problems to further them on their path toward professional productivity until retirement age.

Sports Medicine Clinic

Under the direction of Dr. Roger Larson, the Sports Medicine Service operates an active clinic located in the Hec Edmondson Pavilion. Colleen Johnson, R.N., a member of the clinic staff since 1973, is now a teaching associate on the service. The clinic sees patients aged eight to eighty who have sustained injuries ranging from ankle sprains and torn knee ligaments, to elbow and shoulder problems and back injuries. In addition, the clinic counsels older athletes who want to get back into condition and resume strenuous sports activities.

Harborview Medical Center

Over the past twenty years, Harborview Medical Center has established itself as one of the top centers for the treatment of musculoskeletal trauma in the United States. Eight of the full-time

Harborview Medical Center

faculty of the University of Washington Medical Center are based at Harborview as their primary practice site.

In addition to providing state-of-the-art trauma care for patients with musculoskeletal injuries, each individual faculty member has established an area of special expertise. Drs. Hansen and Sangeorzan staff the extremely busy Foot and Ankle Trauma and Post-Traumatic Reconstruction Division, assisted by Tom Kimmel, P.A. Dr. Keith Mayo has established an international reputation as a pelvic and acetabular surgeon and is assisted by Dr. Chip Routt in the management of these difficult injuries. In addition to his expertise in

Sigvard T. Hansen, Jr., M.D.

sophisticated post-traumatic deformity reconstruction, Dr. Steve Benirschke is an international authority in the reconstruction of os calcis fractures. Dr. Brad Henley has special areas of interest in bone segment transport and limb lengthening with the Ilizarov technique. Dr. Paul Anderson has a full-time assignment managing cervical, thoracic, and lumbar spine fractures and dislocations. In addition to heading the Orthopædic Trauma Division, Dr. Swiontkowski has a special interest in musculoskeletal infection.

Harborview is headquarters for the Department's Trauma Outcome Database, which was formally established in March 1988. This computerized tracking system gives the Department the ability to follow up patients and document the functional outcome of the latest methods of fracture treatment. To date, data have been gathered for some 1,800 injuries including fracture classification, details of injuries, patient demographics, and treatment methods. The staff is making a concerted effort to maintain contact with patients to gather extensive follow-up data that are critical to the tracking program. The resulting documentation will be invaluable for studies on quality control and treatment outcome and for designing prospective studies. Joanne Harmon directs this effort and is assisted by Demetrus White. The project is supported in part by the AO North America Documentation Committee and by a grant from the federal Center for Disease Control for research related to the functional outcome of lower extremity fractures. A future area of interest will focus on the development of functional assessment scales for upper and lower extremity trauma.

The Harborview Outpatient Clinic is directed by Pamela Stevens, R.N., and includes among its staff Annie Boatman, R.N., Marsha Anthony, R.N., and Ted Daily, P.A. Indrek Melder, P.A., assists in the general trauma clinics and with the operative management of trauma patients. The Outpatient Clinic is extremely busy handling the continually escalating population of patients with blunt trauma who come to Harborview from across the Pacific Northwest. Approximately 12,500 patients are seen each year.

Future plans for Harborview Medical Center will include the building of a new Trauma Center, the addition of a new patient care wing, a new outpatient tower, and six additional operating rooms. This expansion will assist the Orthopædic Trauma Division in continuing to deliver excellent patient care to the citizens of the Pacific Northwest.

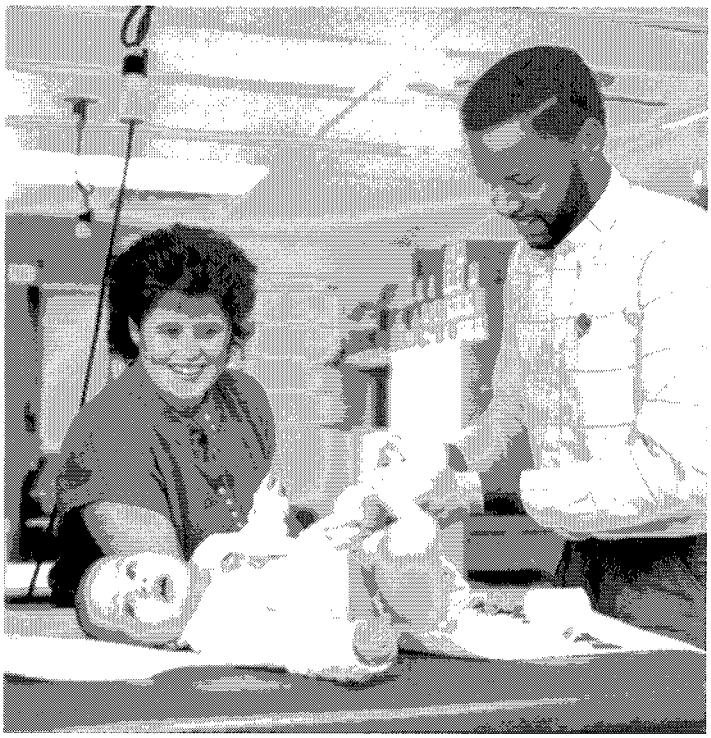
Children's Hospital and Medical Center

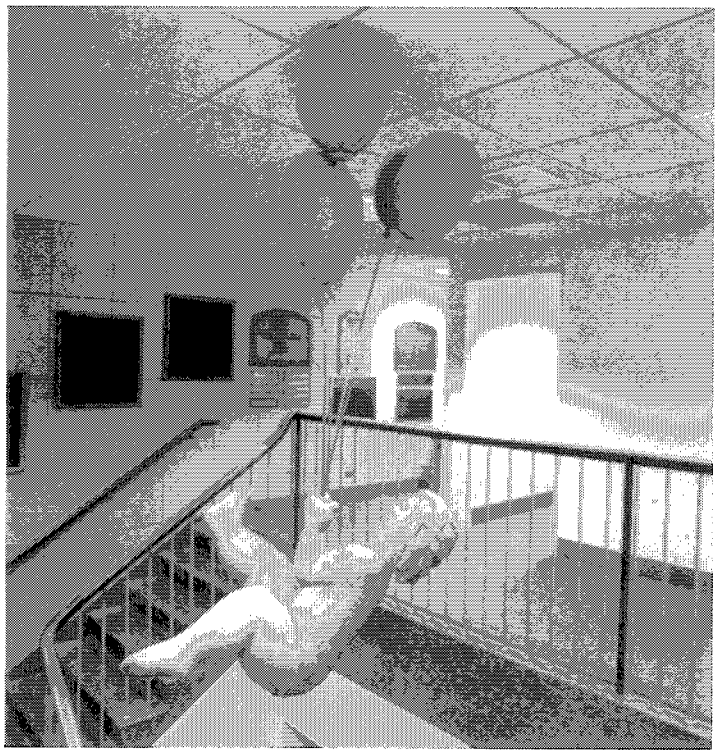
Children's Hospital has earned a national reputation for providing outstanding orthopædic care for children, drawing patients from across the country and abroad as well as from throughout the Northwest. Specialized clinics are staffed by orthopædists based at CHMC, at the University, and from the community and include a mix of pediatric orthopædists and those with expertise in anatomic specialities.

This cooperative relationship assures quality medical care and offers a balance unique for surgical programs at CHMC and those at other children's hospitals throughout the country.

Under the direction of Dr. Lynn Staheli, the full-time orthopædic staff at Children's includes Drs. Vincent Mosca (reconstructive pediatric orthopædics), Mark Dales (spine and general pediatric orthopædics), and Scott Hoffinger (neuromuscular disorders and general pediatric orthopædics). University-based faculty members active in the CHMC program include Drs. Chappie Conrad (tumors), Chip Routt (trauma), Marc Swiontkowski (trauma), and Tom Trumble (hand). Community-based clinical faculty include Drs. Edward Almquist (hand), Allen Bach (hand), John Hendrickson (trauma), Richard Kirby (trauma), Leland Rogge (trauma), David Hanscomb (spine), Howard King (spine), and Mike Legrone (spine).

Clinical research studies are investigating rotational tibial osteotomy, combined osteotomy as a salvage procedure for severe Legg-Calvé-Perthes disease, open reduction of congenital dislocation of the hip, and fibrous dysplasia of long bones in children treated with intramedullary nailing. In the future, the Department's orthopædic unit at Children's Hospital will focus on improving the level of sophistication in patient care and expanding research and educational endeavors. Programs planned for the next decade include:

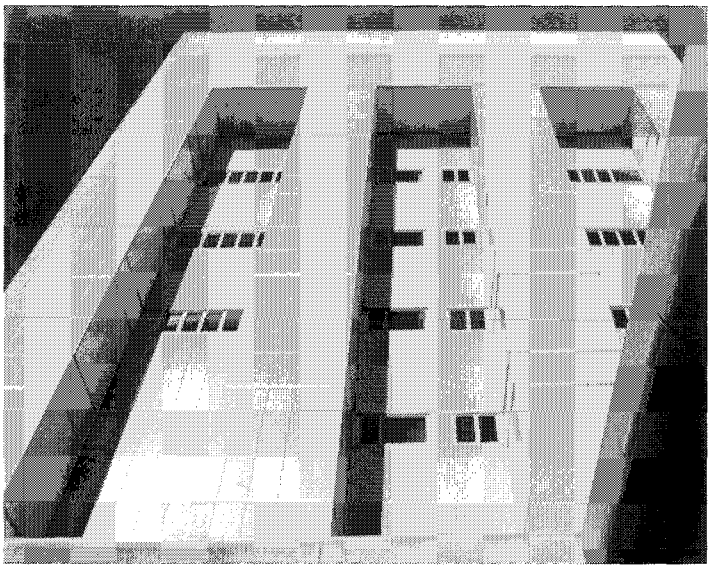




- establishment of a motion analysis laboratory;
- improved outpatient facilities;
- enhanced outreach programs;
- enhanced programs for the adolescent age group;
- expansion of prospective clinical research;
- establishment of a pediatric orthopædic fellowship;
- more involvement in basic research;
- further cooperative programs with the Department of Pediatrics;
- establishment of additional advanced surgical programs such as limb lengthening and free tissue transfers; and
- application of imaging techniques to screening programs.

Veteran's Administration Medical Center

The Seattle VA Hospital has been a component of the orthopædic residency program since about 1960, and rotations there are highly regarded by the residents and continue to be a great strength of the teaching program. Under the direction of Dr. Ted Greenlee, our program is considered to be the premier orthopædic service among the VA hospitals. Through a medical services contract, all of the physicians in the Department of Orthopædics are available to provide medical care at the VA Medical Center.



Veterans Administration Medical Center

The VA facilities also have served as home base for a number of Department research programs, which at present include Dr. Linda Sandell's molecular biology laboratory, a VA-funded research study on foot and ankle mechanics led by Dr. Sangeorzan, and studies on wound healing and skin circulation led by Dr. Matsen.

EDUCATIONAL PROGRAMS
Medical Students

Education of fourth-year medical students is an important component of the teaching program of the Department of Orthopædics. Two rotations are offered, including a two-week preceptorship wherein students work with community orthopædists, many of whom are alumni of the Department's residency program. This preceptorship has proven an invaluable experience for both students and teachers.

More formal month-long rotations are offered at each of the four hospitals in the University system. Under the supervision of Paul Anderson, students are assigned to the various services and work daily with the house staff, participating in outpatient clinics, emergency wards, and during surgical procedures. Emphasis is placed on teaching physical exam skills and diagnosis of orthopædic emergencies. At Harborview Medical Center, members of the clinical faculty work directly with medical students during three morning clinics, providing a valuable one-on-one experience.

A key component of medical student education is the Musculoskeletal Core Course, instituted in 1968 when the medical school curriculum moved from a traditional format to an integrated organ systems model. The original course was the brainchild of Dr. D. Kay Clawson and Dr. Cornelius Rosse of the Department of Biological Structure. The course content, which remains basically unchanged, includes gross anatomy, musculoskeletal pathology, and physiology, including clinical correlations, radiology, and physical exam. Early faculty members still actively invovled in the course are Drs. Walter Stolov and Barbara DeLateur from Rehabilitation Medicine and Dr. Peter Simkin from Rheumatology.

The core course is now ably led by Dr. Carol Teitz of the Department of Orthopædics and Dr. Daniel Graney from Biological Structure, with teaching assitance from a multidisciplinary full-time and clinical faculty. The Musculoskeletal Core Course has been one of

University of Washington Medical Center

the most highly rated courses in the medical school and remains a leader in curriculum innovation. In 1990 it is among the first of the UW medical school courses to be taught using the new technique of problem-based learning.

Orthopædic Residency Program

The goal of the Department's residency program is to turn out top-quality orthopædists with an academic orientation. The Department's four-year program in orthopædic surgery begins in the R2 year after candidates have completed an internship year in a rotating, surgical, or medical program. The R2 and R3 years are spent in rotations at the four University of Washington affiliated hospitals, where the residents learn the principles of outpatient and pre- and postoperative care as well as indications for surgery and basic surgical skills. In the R4 year the residents spend time at the Veterans Administration Hospital and also at Swedish and Virginia Mason Hospitals, private facilities with busy and varied orthopædic services. During the R5 chief residency the emphasis is on mastering surgical skills and decision making, with rotations at University of Washington Medical Center, Harborview Medical Center, Veterans Administration Hospital, and Children's Hospital and Medical Center.

Weekly conferences dealing with general orthopædics, pediatric orthopædics, and trauma are held at each of the affiliated hospitals and are an important component of the residency training experience. The principal academic session, held each Monday morning, consists of didactic presentations on clinical topics and on selected topics in the basic sciences including anatomy, pathology, biomechanics, and physiology. Full-time faculty and clinical faculty participate actively in these conferences. Recently, the Department has instituted monthly grand rounds attended by both full-time and clinical faculty.

During their four years of training, residents are exposed to "state-of-the-art" management of all clinical orthopædic problems. Residents who desire research experience also have the opportunity to participate in ongoing basic science or clinical studies being conducted by Department faculty. Residents conduct at least one major investigative project during their tenure with the Department.

Approximately one in five graduating residents goes into practice in an academic setting, while the rest enter private practice. Our Department points with pride to the fact that over the past forty years the orthopædic residency program at the University of Washington has trained nearly 140 of the best orthopædic surgeons in the United States. There is no question that the graduates of our program can hold their own with anyone in respect to their skills in clinical evaluation and management as well as their critical approach to the evaluation of new knowledge.

"Thinking back to those challenging years of residency I recall the series of conferences that formed the core of the educational program. Each had a personality and aura: Monday morning conference at the University was a mixed bag of dread, apprehension, and anxiety about being "tooled" by the faculty or senior residents. Wednesday morning conference at Children's was a joy, seeing cases and management discussed candidly with a surprising depth of knowledge on the part of the community orthopædists. Thursday morning at Harborview was a wonderful mix of daring techniques and long follow-ups, which always kept the attendings on their feet trying to anticipate all the possible courses a particular case might take. Ranked in value to me now, the COH conference was best, Harborview was the most fun, and the "U" still makes me regret Monday!"

Jonathan L. Knight

Our Backbone—The People
Department of Orthopædics Faculty

Paul A. Anderson, M.D.
Assistant Professor
Dr. Paul Anderson, a specialist in spine trauma and reconstruction, is based at Harborview Medical Center. He joined the faculty in 1985 following a spine fellowship with Dr. Henry Bohlman at Case Western Reserve University. Dr. Anderson received his M.D. degree and completed his orthopædic residency training at Wayne State University. He earned a B.S.E. in chemical engineering from the University of Michigan. He holds grants for research in three areas: biomechanical analysis of anterior cervical plate fixation, a comparison of cephazolin and cephaperazone in open fractures, and the biomechanics of bone retropulsed into the canal in spinal fractures. Dr. Anderson is a fellow of the American Academy of Orthopædic Surgeons. He serves as chairman of the Department's Student Clerkship Committee.

Michele C. Battié, Ph.D., R.P.T.
Research Assistant Professor
Dr. Michele Battié is associate director of the Spine Resource Clinic at the University of Washington and co-investigator, with Dr. Stanley Bigos, on the UW's landmark study of back problems among industrial workers. Dr. Battié received her doctorate of medical science from the University of Gothenburg in 1989 for her research work at the UW. She also holds a B.S. in physical therapy and an M.S. in rehabilitation medicine from the University of Washington. She is a member of the International Society for the Study of the Lumbar Spine.

Stephen K. Benirschke, M.D.
Assistant Professor
Dr. Steve Benirschke is a member of the traumatology team at Harborview Medical Center. He came to the UW in 1985 following an AO fellowship in Chur, Switzerland. Dr. Benirschke received his M.D. degree at Case Western Reserve University and completed his orthopædic residency training at that institution. He also holds a B.A. in biology from the University of California at San Diego. Dr. Benirschke is conducting research on the use of limb load/frame strain relationships to evaluate the effects of preload and of healing on the rigidity of tibial fractures under an AO/ASIF research grant. He also is among a select group of world experts on the management of os calcis fractures. Dr. Benirschke is a fellow in the American Academy of Orthopædic Surgeons.

Stanley J. Bigos, M.D.
Associate Professor
Dr. Stan Bigos is a specialist in spine and low back pain at the University of Washington Medical Center where he founded and directs the UW Spine Resource Clinic. For the past eight years he has been primary investigator for a series of retrospective and prospective studies on factors contributing to low back pain among workers in industry. He is particularly interested in developing guidelines for physicians treating back problems and for the education of patients in recovery programs. Dr. Bigos joined the UW faculty in 1981 after completing his residency in orthopædic surgery at the University of Utah. He received both an M.D. degree and a B.S. in physical therapy from the University of Missouri. Dr. Bigos is a fellow of the American Academy of Orthopædic Surgeons and a member of the International Society for the Study of the Lumbar Spine.

John Monte Clark, Jr., M.D., Ph.D.
Associate Professor
Dr. John Clark is an alumnus of the orthopædic residency program at the UW. He graduated from the University of Kansas with a B.A. in chemistry, earned a Ph.D. in anatomy at the University of Chicago, and received his M.D. degree from Pritzker School of Medicine. Following his residency training he did a year-long research fellowship with M.A.R. Freeman in London. Prior to joining the UW faculty in 1986, Dr. Clark served as a staff orthopædic surgeon at the Seattle Public Health Hospital and as chief of the Orthopædic Service at Pacific Medical Center. Based at the University of Washington Medical Center, Dr. Clark's clinical focus is the surgery of arthritis. As founder and director of the Morphology Laboratory, he is concentrating his research interests in the functional anatomy of cartilage and on aspects of joint structure including the hip muscles, rotator cuff, and anterior cruciate ligament.

Ernest U. Conrad III, M.D.
Assistant Professor
Dr. "Chappie" Conrad, one of the few orthopædists in the Northwest with a specialty in musculoskeletal oncology, divides his clinical activities between Children's Hospital and the UW Medical Center, where a Tumor Service has been established based on an organized team approach. Dr. Conrad joined the faculty in 1986 following fellowships in orthopædic oncology with William Enneking at the University of Florida and in pediatric orthopædics with Mercer Rang at The Hospital for Sick Children in Toronto. He earned his medical degree from the University of Virginia and completed residency training at The Hospital for Special Surgery, Sloan Kettering/Memorial Hospital of Cornell Medical Center. At the UW Dr. Conrad is director of the Division of Musculoskeletal Oncology and Tissue Banking. His research interests revolve around the biochemical classification of chondrosarcomas and osteosarcomas, as well as clinical research on the assessment of spine tumors in children and the imaging of osteosarcomas in adults. Dr. Conrad also is medical director of the Northwest Musculoskeletal Tissue Center and is a fellow of the American Academy of Orthopædic Surgeons.

Mark C. Dales, M.D.
Assistant Professor
One of the recent additions to our faculty, Dr. Dales joined the staff at Children's Hospital in 1989 where he is active in general orthopædics and the development of an institutionally based component of the spine program. Dr. Dales received his medical degree from the University of Nevada and completed his orthopædic residency at the University of Utah, during which he also spent a year engaged in research in the orthopædic bioengineering laboratory. Prior to coming to Seattle, Dr. Dales was a clinical fellow in pediatric orthopædic surgery and spinal deformity at Texas Scottish Rite Children's Hospital in Dallas. At CHMC his clinical practice focuses on management of scoliosis and general pediatric orthopædic surgery. Dr. Dale's research interests are directed to neuromuscular scoliosis and pediatric hip infection.

David R. Eyre, Ph.D.
Professor
Dr. David Eyre, the first holder of the Ernest M. Burgess Chair in Orthopædics, is internationally recognized for his work on the biochemistry of bone and cartilage. Dr. Eyre joined the faculty in 1985, coming to the UW from Harvard University where he was associate professor of biological chemistry in the Department of Orthopædic Surgery and senior research associate in orthopædic surgery at Boston's Children's Hospital Medical Center. Born and educated in England, Dr. Eyre earned B.S. and Ph.D. degrees in biochemistry from the University of Leeds. He has held research positions at the Kennedy Institute of Rheumatology in London, the Massachusetts General Hospital, Children's Hospital Medical Center (Boston), and Harvard University. At the University of Washington Dr. Eyre also is an adjunct professor of biochemistry and director of the Orthopædic Research Laboratories. He is an associate scientific member of the American Academy of Orthopædic Surgeons and is a member of the Board of Associate Editors of the *Journal of Orthopædic Research*. Dr. Eyre's major research interests focus on connective tissue biochemistry, collagen chemistry, cartilage pathology, inborn skeletal diseases, the biochemistry of the intervertebral disk, and bone resorption and osteoporosis. He is chairman of the Department's Research Management Committee.

Theodore K. Greenlee, Jr., M.D.
Associate Professor
A member of the faculty since 1971, Dr. Ted Greenlee serves as chief of the Orthopædic Section at the Veterans Administration Medical Center, where he is endeavoring to create an environment conducive to learning and science. He received both his B.S. and M.D. degrees from Northwestern University and is an alumnus of the orthopædic residency program at the UW. After completing a fellowship in experimental pathology at the UW, Dr. Greenlee spent four years on the faculty at the University of Florida in Gainesville before returning to the UW. He is a member of the American Academy of Orthopædic Surgeons.

Sigvard T. Hansen, Jr., M.D.
Professor
Over his 22 years on the faculty, Dr. Ted Hansen has earned an international reputation for his expertise in orthopædic traumatology with particular emphasis on foot and ankle injuries. Dr. Hansen served as chairman of the Department of Orthopædics from 1981 to 1985, then returned full-time to the position of orthopædist-in-chief at Harborview Medical Center to devote himself to clinical, research, and teaching activities. A native of Spokane, Dr. Hansen earned his B.A. at Whitman College and his M.D. degree from the University of Washington. He is an alumnus of the UW orthopædic residency program and first joined the faculty as an instructor in 1968. Among his responsibilities at the UW and affiliated institutions, Dr. Hansen is a member of the medical executive board at Harborview Medical Center and is director of the STAMP program (Special Teams for Amputations, Mobility, Prosthetics/Orthotics) at the VA Medical Center. He also is exceptionally active in national and international organizations, serving on the Board of Trustees of AO/ASIF Foundation, the Board of Directors of AO International, and the Laboratory for Experimental Surgery in Davos. He is a member of the editorial board for the *Journal of Orthopædic Trauma* and a consultant reviewer for the *Journal of Bone and Joint Surgery*. Dr. Hansen is a founding member of the Orthopædic Trauma Association and is a fellow of the American Academy of Orthopædic Surgeons.

Douglas T. Harryman II, M.D.
Assistant Professor
Dr. Doug Harryman joined the faculty in 1989 following a fellowship in shoulder and elbow surgery at the UW. Dr. Harryman holds a B.S. degree from Virginia Polytechnic Institute, an M.D. degree from the Medical College of Virginia, and completed his orthopædic residency training at West Virginia University Medical Center. Prior to coming to Seattle, he served for four years as an orthopædic surgeon with the U.S. Air Force. As codirector of the UW Medical Center Shoulder and Elbow Service, Dr. Harryman is helping to expand the service by developing arthroscopic techniques in the shoulder and elbow and technical advances in reconstructive surgery. His current research interests focus on the study of glenohumeral kinematics applying a three-dimensional motion analysis computer-linked system. Dr. Harryman is a fellow of the American Academy of Orthopædic Surgeons.

M. Bradford Henley, M.D.

Assistant Professor

Dr. Brad Henley joined the faculty in 1988 as a traumatologist based at Harborview Medical Center. Prior to coming to the UW, he was on the faculty at the University of Texas at Dallas. Dr. Henley earned a B.S. degree in molecular and cellular biology and an M.D. degree from the University of Washington. After completing his orthopædic residency at the University of Texas at Dallas, he served for three months as a senior registrar at the Norfolk and Norwich Hospital in England, and then did a year-long fellowship in traumatic and reconstructive orthopædic surgery with Bernd Claudi at the Technical University of Munich. Dr. Henley's research interests focus on the biomechanics of long bone fracture stabilization, and his clinical interests lie in the areas of spinal fractures and dislocations, musculoskeletal trauma of the extremities, and equalization of limb length inequality. He is a fellow of the American Academy of Orthopædic Surgeons.

Scott A. Hoffinger, M.D.

Assistant Professor

Dr. Scott Hoffinger, a pediatric orthopædist, joined the faculty in 1989 based at Children's Hospital and Medical Center. He earned his B.A. and M.D. degrees in the combined six-year program at the University of Michigan. Following his residency in orthopædic surgery at Yale University, he completed a fellowship in pediatric orthopædics at the University of California-Davis Medical Center. Dr. Hoffinger is head of research at CHMC, where he is pursuing clinical interests in neuromuscular disease and spinal disorders, and is spearheading the development of a gait lab and motion analysis facility.

William L. Lanzer, M.D.

Associate Professor

Dr. Bill Lanzer joined the UW faculty in 1984 following a fellowship in adult reconstructive surgery at the Mayo Clinic. He holds an M.D. degree from Washington University School of Medicine, an M.S. in medical science from Rutgers Medical School, an M.Ed. in counseling psychology from North Carolina State University, and a B.A. in psychology from UCLA. Following his internship and one year of residency training, Dr. Lanzer spent two years as a clinical associate in surgical oncology at the National Cancer Institute in Bethesda before returning to the University of California-San Diego to complete his orthopædic residency. At the UW Dr. Lanzer is concentrating on combining a first-class implant service with relevant research in osteonecrosis, arthritis, and biocompatibility. His activities are based at UW Medical Center and the VA Medical Center. Dr. Lanzer is an associate editor of *Clinical Orthopaedics and Related Research* and a consulting editor for the *Journal of Orthopædic Research* and the *American Journal of Sports Medicine*. He is a fellow in the American Academy of Orthopædic Surgeons.

Roger V. Larson, M.D.

Associate Professor

Dr. Roger Larson, a faculty member since 1982, is director of the Division of Sports Medicine and as director of the Department's Residency Training Program is in charge of resident selection, rotations, and counseling. He earned both his medical degree and a B.S. in mechanical engineering from the University of Utah. Following orthopædic residency training at the University of Utah he spent three years in private practice as a general orthopædic surgeon. Prior to coming to Seattle, Dr. Larson completed a fellowship in knee reconstructive surgery and arthroscopy at the Cincinnati Sports Medicine and Orthopædic Center. Dr. Larson's clinical areas of special interest focus on treatment of knee injuries with emphasis on arthroscopic surgery and treatment of ligamentous injuries. His current research work focuses on basic investigations related to ligament length relationships in the moving knee and clinical research monitoring the long-term effectiveness of arthroscopic anterior cruciate ligament reconstruction using hamstring tendon autografts. Dr. Larson is a fellow in the American Academy of Orthopædic Surgeons.

Frederick G. Lippert III, M.D., Ph.D.

Associate Professor

Dr. Fred Lippert is a graduate of the U.S. Naval Academy at Annapolis. He spent four years on active duty in the Navy before entering medical school at the University of Vermont. Dr. Lippert served an internship at Royal Victoria Hospital in Montreal and completed his orthopædic residency training at the University of Vermont. He also earned a Ph.D. in medical science from the Karolinska Institute in Stockholm. Dr. Lippert joined the UW faculty in 1972, and from 1974 to 1984 served as chief of orthopædics at the Veterans Administration Hospital. He presently directs the Foot Clinic at the UW Medical Center. Active in the area of orthopædic education, Dr. Lippert has chaired the American Academy of Orthopædic Surgeons Basic Course for Orthopædic Educators since 1976, and also helped the AAOS initiate the concept of hands-on CME courses. He directs the Department's psychomotor skills course for residents and has become a widely recognized expert on this subject. Dr. Lippert is a fellow in the AAOS and a founding member of the American Society for Biomechanics.

Frederick A. Matsen III, M.D.
Professor and Chairman
Dr. Rick Matsen, a specialist in the shoulder and elbow, has been chair of the Department of Orthopædics since January 1986 and a member of the faculty since 1974. He also is an alumnus of the UW orthopædic residency program. Dr. Matsen received his B.A. from the University of Texas at Austin and his M.D. degree from Baylor University. Following an internship year at Johns Hopkins University, he did a two-year fellowship at the National Institute of Neurological Disease and Stroke before beginning his orthopædic residency in Seattle. In 1983 he was awarded an AOA/ABC Traveling Fellowship to Great Britain and South Africa. Among his numerous responsibilities at the national level, Dr. Matsen is a founding member and president-elect of American Shoulder and Elbow Surgeons and chair of that organization's membership and research committees. He has assumed active leadership roles in various committees of the American Academy of Orthopædic Surgeons including serving as chair of the Committee on Shoulder and Elbow for 1990. Dr. Matsen also is an associate editor of the *Journal of Orthopædic Research* and editor of *Video Journal of Orthopædics*. He is the author of *Compartment Syndromes* and is co-editor (with Charles Rockwood) of *The Shoulder*.

Keith A. Mayo, M.D.
Assistant Professor
Dr. Keith Mayo, a traumatologist based at Harborview, joined the faculty in 1988. He graduated from Stanford University and earned his medical degree at the University of Washington. Following orthopædic residency training at the UW, Dr. Mayo completed an AO-sponsored fellowship in musculoskeletal trauma and reconstructive orthopædics at the University of Ulm and the University of Bern. After returning to Seattle, Dr. Mayo served four years as an attending physician at Pacific Medical Center and also joined the clinical faculty at the UW. Dr. Mayo is a member of the Orthopædic Trauma Association and a fellow in the American Academy of Orthopædic Surgeons.

Vincent S. Mosca, M.D.
Assistant Professor
Dr. Vince Mosca, head of Orthopedic Clinical Services at Children's Hospital, joined the full-time faculty in 1988. He earned both a B.A. in biology and his medical degree from the University of Rochester. Following internship and a year of residency training in general and thoracic surgery at Duke University Medical Center, Dr. Mosca completed his orthopædic surgery residency at that institution. He then went to Toronto for a year-long fellowship in pediatric orthopædic surgery at The Hospital for Sick Children. Dr. Mosca joined us in Seattle in 1985, initially as a member of the clinical faculty at Children's Hospital. Dr. Mosca has special clinical and research interests in foot deformities, limb length inequalities and the Ilizarov method, multiplanar deformities of the extremities, and the orthopædic aspects of myelodysplasia. He is a member of the Pediatric Orthopædic Society of North America and is a fellow in the American Academy of Orthopædic Surgeons. Dr. Mosca chairs the Department's Resident Curriculum Committee.

Christopher Niyibizi, Ph.D.
Research Associate
A member of Dr. David Erye's orthopædic research laboratory team, Dr. Chris Niyibizi is concentrating on the isolation and characterization of bone matrix collagens. He joined the Department in 1985, moving here with the Eyre team from Harvard Medical School where he was a research fellow in biological chemistry. He previously held research assistantships at McGill University/Shriner's Hospital for Crippled Children in Montreal and in the Department of Biochemistry at Rutgers Medical School. Dr. Niyibizi earned his Ph.D. from the Division of Experimental Medicine at McGill University, and also holds a M.S. in biochemistry from Rutgers University and a B.A. in biology from the University of Massachusetts.

M.L. Chip Routt, Jr., M.D.
Assistant Professor
Dr. Chip Routt, a traumatologist, joined the Department in 1989 and is based at Harborview Medical Center. He graduated with a B.S. from Texas A&M University and received his medical degree from the University of Texas Medical Branch. Dr. Routt completed his orthopædic surgery residency at Vanderbilt University and then did a traumatology fellowship at Harborview before becoming a member of the faculty. Dr. Routt is especially interested in clinical teaching and research activities and is working to develop a pediatric trauma service in conjunction with Children's Hospital.

Linda J. Sandell, Ph.D.
Associate Professor
In her laboratory at the VA Medical Center, Dr. Linda Sandell is investigating the pathogenesis of such cartilage diseases as osteoarthritis and rheumatoid arthritis. She joined the Department in 1987 and also is an adjunct associate professor in the Department of Biochemistry. Prior to coming to the UW, Dr. Sandell was an assistant professor in the Department of Biochemistry and the Department of Orthopædic Surgery at Rush Medical College, Rush-Presybterian-St. Luke's Medical Center in Chicago. She earned a B.S. in zoology and an M.S. in biological sciences from Denver University and received her doctorate in biochemistry from Northwestern University. She also did a postdoctoral fellowship in molecular biology at the University of Chicago. Among her professional activities, Dr. Sandell is a member of the General Medicine A Study Section of the

National Institutes of Health, and is a member of the Orthopædic Research Society and the American Society of Biochemistry and Molecular Biology. She recently was awarded an Associate Investigator Award by the Veterans Administration.

Bruce J. Sangeorzan, M.D.

Assistant Professor

Dr. Bruce Sangeorzan joined the Department in 1986 following completion of his orthopædic residency training at Wayne State University. He also received his M.D. degree from Wayne State and a B.S. in biology from the University of Michigan. Dr. Sangeorzan is based on the Traumatology Service at Harborview where he is pursuing clinical and laboratory interests in disorders of the foot and is initiating a study of the biomechanics of the hindfoot. He is a member of the American Orthopædic Foot and Ankle Society. He recently was awarded a VA Merit Review Grant to study hindfoot mechanics.

John A. Sidles, Ph.D.

Assistant Professor

A physicist and a member of the faculty since 1984, Dr. John Sidles is a key member of the research team known as the Interactive Graphics for Orthopædic Surgeons (IGOS) group based at the UW. After earning a B.A. in physics from the University of Iowa, Dr. Sidles spent three years as a National Science Foundation Fellow at the University of Chicago where he worked in high-energy physics research. He received his Ph.D. degree in physics from the University of Washington and then spent three years as a research scientist at Dynamics Techology in Torrance, California, where he was principal investigator for a number of research projects involving various electromagnetic, hydrodynamic, and acoustic phenomena of interest to government agencies. At the UW, Dr. Sidles has developed an interactive graphics system with research focusing on ligament relationships in the knee.

Lynn T. Staheli, M.D.

Professor

Dr. Lynn Staheli, a member of the faculty since 1975, is director of the Department of Orthopedics at Children's Hospital and Medical Center. Through his work at CHMC Dr. Staheli has established the subspecialty of pediatric orthopædics in the Northwest and has promoted the development of Children's as a major center for orthopædic care. Dr. Staheli is an alumnus of the UW orthopædic residency program and also held a clinical fellowship in orthopædics from the United Cerebral Palsy Research and Educational Foundation. He earned his M.D. degree from the University of Utah and a B.S. from Brigham Young University. Dr. Staheli has won international recognition for his clinical and research work to develop procedures such as acetabular augmentation for correction of hip deformities in children. He also has conducted studies in lower extremity development that provide a basis for rational management of disorders of the lower limbs. Dr. Staheli is the founding editor of the *Journal of Pediatric Orthopedics* and is a member of the Pediatric Orthopædic Society of North America and a fellow in the American Academy of Orthopædic Surgeons.

Marc F. Swiontkowski, M.D.

Associate Professor

Dr. Marc Swiontkowski serves as the Department's vice chairman and is chief of orthopædic traumatology at Harborview Medical Center. He is a graduate of California State University-Fullerton and earned his M.D. degree at the University of Southern California. A 1984 alumnus of the UW orthopædic residency program, he went on to do a nine-month fellowship at the Laboratory for Experimental Surgery in Davos, Switzerland, and then spent four months as an orthopædic consultant at Kilimanjaro Christian Medical Center in Moshi, Tanzania. Before returning to the University of Washington in 1988, Dr. Swiontkowski spent three years at Vanderbilt University as a faculty member in the Department of Orthopædics and Rehabilitation. He has been honored with the AOA North American Traveling Fellowship in 1985 and the AOA/ABC Traveling Fellowship in 1989. At Harborview Dr. Swiontkowski is conducting research on laser Doppler flowmetry, cortical bone blood flow under bone plates, and development of a pinless external fixation system. He also is spearheading the development of the Orthopædic Trauma Outcome Database. He is a fellow in the American Academy of Orthopædic Surgeons and a member of the American Association for the Surgery of Trauma.

Carol C. Teitz, M.D.

Associate Professor

Dr. Carol Teitz joined the Department in 1980 after completing her orthopædic residency training at the UW. She earned an M.D. degree at Yale University and received a B.S. from the University of Cincinnati. Dr. Teitz is based in the Division of Sports Medicine at the UW where she pursues clinical interests in the musculoskeletal problems of dancers and musicians and conducts epidemiologic research on sports-related injuries. Dr. Teitz also chairs and teaches two courses in the medical school: the Musculoskeletal Core Course and Scientific Foundations of Sports Medicine. She is a fellow in the American Academy of Orthopædic Surgeons and serves on the AAOS Sports Medicine Committee and the Research Committee of the American Orthopædic Society for Sports Medicine. In addition, she is a member of the editorial boards of *Sports Medicine Today* and *Dance Medicine Health Newsletter* and is editor of the text *Scientific Foundations of Sports Medicine.*

Allan F. Tencer, Ph.D.
Associate Professor
Dr. Allan Tencer, director of the Biomechanics Laboratory, joined the faculty in 1988. He also holds adjunct appointments in the Departments of Bioengineering and Mechanical Engineering. Dr. Tencer earned bachelor's, master's, and doctoral degrees in mechanical engineering from McGill University. Prior to coming to the UW, he was a faculty member in the Department of Orthopædic Surgery at the University of Texas Medical Branch in Galveston. Earlier in his career he was an assistant professor of biomedical and mechanical engineering at the University of Texas at Arlington and of orthopædic surgery at the University of Texas Health Science Center at Dallas. Dr. Tencer's areas of research interest include fracture fixation, spine and joint biomechanics, bioceramics, biodegradable materials, and quantitative testing in rehabilitation. He is a member of the Orthopædic Research Society, the American Society of Mechanical Engineers, and the Society for Biomaterials.

Thomas E. Trumble, M.D.
Associate Professor
Dr. Trumble joined the Department in 1989 as chief of the Hand and Microvascular Surgery Service based at the UW Medical Center. He is working to develop a service that coordinates both the surgery and rehabilitation of the hand at the four UW affiliated hospitals. Prior to coming to the UW, Dr. Trumble was a member of the faculty and chief of the Orthopædic Hand Surgery Section at Yale University. He is a graduate of California State University-Sacramento and earned his M.D. degree from Yale University, where he also did his orthopædic residency training. Dr. Trumble completed a microsurgical fellowship at Duke University and a hand fellowship at Massachusetts General Hospital/Harvard Medical School. His research interests lie in the area of peripheral nerve regeneration and wrist biomechanics. Dr. Trumble is a member of the Orthopædic Research Society, American Academy of Orthopædic Surgeons, and the American Society for Surgery of the Hand.

Jiann-Jiu Wu, Ph.D.
Research Assistant Professor
A member of Dr. David Eyre's research team, Dr. Wu joined the Department in 1985. He graduated from Fu Jen Catholic University in Taiwan with a B.S. in biology and earned an M.S. in biology from Illinois State University. After receiving a Ph.D. in food science and technology from Texas A&M University, he spent several years as a research associate at Kansas State University. Prior to coming to Seattle, Dr. Wu was a research fellow in biological chemistry at Harvard School of Medicine and a research associate in orthopædic surgery at The Children's Hospital, Boston. His research interests focus on the biochemistry of bone and cartilage collagens and their changes in disease.

Additional Faculty Members

Elizabeth B. Crouch, P.A.
Teaching Associate, UWMC Bone and Joint Center

Kathryn A. Curtis, P.A.
Health Care Specialist, Musculoskeletal Oncology

Colleen F. Johnson, R.N.
Teaching Associate, Division of Sports Medicine

Thomas J. Kimmel, P.A.
Teaching Associate, Harborview Medical Center

Ivory V. Larry, O.P.A.
Teaching Associate, UWMC Bone and Joint Center

Indrek Melder, P.A.
Teaching Associate, Harborview Medical Center

Stephen G. Rice, M.D., Ph.D.
Lecturer, Division of Sports Medicine

D. Michael Strong, Ph.D.
Research Professor, Puget Sound Blood Center

Adjunct Faculty

Daniel O. Graney, Ph.D.
Adjunct Associate Professor (Biological Structure)

Lawrence A. Mack, M.D.
Adjunct Professor (Radiology)

Michael L. Richardson, M.D.
Adjunct Associate Professor (Radiology)

Keith Wang, M.D.
Adjunct Assistant Professor (Radiology)

Department of Orthopædics Clinical Faculty 1989-1990

As originated by Dr. D. Kay Clawson, the clinical faculty of the Department of Orthopædics constitutes a most valuable teaching resource. These orthopædists take time away from their private practices to contribute to the Department's academic programs and to serve as attending physicians in clinics at our affiliated medical centers. We are proud of our clinical faculty.

Clinical Faculty Committee
Park W. Gloyd, M.D.—Co-chair
Frederick W. Lippert III, M.D.—Co-chair
Edward E. Almquist, M.D.
Ernest M. Burgess, M.D.
John Burns, M.D.
Richard M. Kirby, M.D.
Keith Mayo, M.D.
Mar Mullen, M.D.
Vincent S. Mosca, M.D.
Ray Robinson, M.D.
James B. Smith, M.D.
Hugh Toomey, M.D.

Clinical Professor
John H. Aberle, M.D.
Edward E. Almquist, M.D.
Paul Wilson Brand, M.D.
Ernest M. Burgess, M.D.
Park W. Gloyd, M.D.
Thomas M. Green, M.D.
Walter F. Krengel, M.D.
St. Elmo Newton, M.D.
John T. Sack, M.D.
James B. Smith, M.D.
Hugh E. Toomey, M.D.
Robert A. Winquist, M.D.

Clinical Professor Emeritus
Donald Ritson Gunn, M.D.
Robert W. Maris, M.D.
John E. Stewart, M.D.
James W. Tupper, M.D.

Clinical Professor/Staff Surgeon
James W. Miller, M.D.

Clinical Associate Professor
David W. Anderson, M.D.
Allan W. Bach, M.D.
John H. Bargren, M.D.
William G. Boettcher, M.D.
Bruce E. Bradley, M.D.
John F. Burns, M.D.
David M. Chaplin, M.D.
John Ernest Dunn, M.D.
Ray H. Fenner, M.D.
David W. Grainger, M.D.
John Martin Hendrickson, M.D.
David E. Karges, M.D.
Howard A. King, M.D.
Richard M. Kirby, M.D.
Harry H. Kretzler, M.D.
Edwin L. Laurnen, M.D.
Edward L. Lester, M.D.
Kenneth Yuk Kan Leung, M.D.
Dhanvant J. Madhani, M.D.
Kenneth L. Martin, M.D.
Richard G. McCollum, M.D.
E. Bruce McCornack, M.D.
Richard P. McCullough, M.D.
William J. Mills, M.D.
Edward J. Mills, M.D.
Marr Mullen, M.D.
Edward R. North, M.D.
Robert R. Oden, M.D.
Raymond P. Robinson, M.D.
Leland R. Rogge, M.D.
Robert E. Stack, M.D.
William T. Thieme, M.D.
Irving Tobin, M.D.
Robert G. Veith, M.D.
Theodore A. Wagner, M.D.
James K. Weaver, M.D.
Richard A. Zorn, M.D.

Clinical Assistant Professor
Steven J. Anderson, M.D.
Craig T. Arntz, M.D.
Ivar W. Birkeland, M.D.
Thomas R. Boyce, M.D.
Richard A. Dimond, M.D.
John R. Freeman, M.D.
Stanley A. Herring, M.D.
Larry D. Iversen, M.D.
Sarah E. Jackins, R.P.T.
Carleton Keck, M.D.
Rodney E. Kirk, M.D.
David C. Loken, M.D.
Robert G. McConnell, M.D.
John E. McDermott, M.D.
Charles Robert McGill, M.D.
Carol Ann Mowry, M.D.
Franklin T. Paudler, M.D.
Larry R. Pedegana, M.D.
Charles A. Peterson, M.D.
James W. Pritchett, M.D.
Kent Saltonstall, M.D.
Pierce E. Scranton, M.D.

Clinical Instructor
Rosemary Agostini, M.D.
Richard L. Angelo, M.D.
Merritt Kevin Auld, M.D.
William P. Barrett, M.D.
Marion A. Bartl, M.D.
Lance N. Brigham, M.D.
John F. Buckmiller, M.D.
Gary J. Clancy, M.D.
Herbert R. Clark, M.D.
Robert S. Derkash, M.D.
Daniel L. Flugstad, M.D.
Stephen Earl Fuhs, M.D.
A. Patricia Gorai, M.D.
David Alfred Hanscom, M.D.
Charles V. Helming, M.D.
Lawrence E. Holland, M.D.
John P. Holland, M.D.
Thomas W. Hutchinson, M.D.
Jonathan L. Knight, M.D.
Dennis J. Kvidera, M.D.
Peter R. Mandt, M.D.
Michael E. Morris, M.D.
Joseph N. Morris, M.D.
Courtney Nevitt, M.D.
Howard Putter, M.D.
Steven S. Ratcliffe, M.D.
Paul H. Reiss, M.D.
David Phillip Ruoff, M.D.
Gerald M. Seligman, M.D.
Henry A. Tanz, M.D.
John L. Thayer, M.D.
Stephen J. Walker, M.D.
Paul F. Williams, M.D.

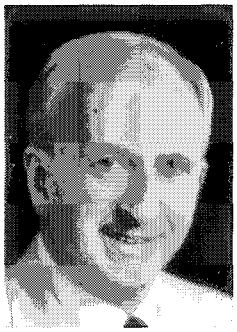
Clinical Associate
Dennis R. Dice, D.P.M.
Thomas Larrick Kalivas, D.P.M.
Marc A. Kravette, D.P.M.
Stanley G. Newell, D.P.M.
Dell A. Schweitzer, D.P.M.
James A. Steward, D.P.M.

Affiliate Instructor
Richard M. Harrington, M.S.

Clinical Consultant
John J. Callahan, M.D.
William R. Duncan, M.D.
Harry E. Emmel, M.D.
Einar Henriksen, M.D.

Residency Program Alumni

Our 25th Anniversary Book Team made valiant efforts to contact all alumni for information and photographs. We hope you enjoy catching up on the lives and activities of those who responded. For those we did not hear from, the listing includes the most recently available address and some basic information from our records.

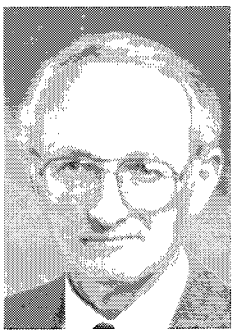


John H. Aberle, M.D.
Education: M.D., Temple University, 1952; UW Orthopædics, 1957
Practice: General orthopædics with special interests in foot and ankle; appointments at Swedish, Providence, Children's Hospital, Cabrini
Affiliations: Clinical professor, University of Washington
Family: Spouse: Joann; children: Mark, Maren
Interests: Boating, rowing, flying, skiing, carpentry
Future: Retirement hoped by age 65
Office: Seattle Orthopædic and Fracture Clinic,
801 Broadway, Seattle, WA 98122
(206/292-7550)
Home: 5408 91st SE, Mercer Island, WA 98040 (206/232-1690)

Paul J. Abbott, M.D.
Education: M.D., Medical College of Virginia, 1980; UW Orthopædics, 1985
Practice: Knee surgery, arthroscopy; appointments at Virginia Beach General Hospital
Interests: Philately
Family: Spouse: Jan; children: Bryan, Kelsey
Office: 1016 First Colonial Rd., Virginia Beach, VA 23454 (804/481-4708)
Home: 1448 N. Woodhouse Rd., Virginia Beach, VA 23454 (804/481-7254)

Jeffrey W. Akeson, M.D.
Education: M.D., University of Washington, 1979; UW Orthopædics, 1984
Practice: Pediatric orthopædics; appointment at Methodist Medical Center, Proctor Community Hospital
Affiliations: Clinical instructor, Department of Surgery, University of Illinois College of Medicine; board member, Institute of Physical Medicine and Rehabilitation, Peoria
Family: Spouse: Beth; children: Tyler, Eric, Todd
Interests: Tennis, music
Future: Enjoying wife and children, improving orthopædic skills, developing a subspecialty practice
Office: Associated Orthopædic Surgeons of Peoria, 2805 North Knoxville Ave., Peoria, IL 61604 (309/682-6649)
Home: 4207 Grandview Dr., Peoria, IL 61604 (309/682-6447)

Edward E. Almquist, M.D.
Education: M.D., University of Washington, 1961; UW Orthopædics, 1969
Practice: Hand surgery, interests in nerve regeneration, basic physiology, laser applications to nerve repair, wrist pathophysiology, Kienbock's disease; appointments at Swedish, Children's Hospital
Affiliations: Clinical professor, University of Washington
Family: Spouse: Sally; children: Brian, Douglas
Interests: Fishing, skiing, sailing, hunting
Future: Continue practicing and research interests, continue writing; enjoy life
Office: 801 Broadway, Suite 701, Seattle, WA 98122 (206/292-6252)
Home: 4336–53rd NE, Seattle, WA 98105 (206/525-4868)



Franklin G. Alvine, M.D.
Education: M.D., University of Washington, 1964; UW Orthopædics, 1971
Practice: Total joint replacements, foot and ankle surgery; chief of staff, Sioux Valley Hospital
Family: Spouse: Marilyn; children: Cyndi, Greg, Grant; one grandson
Interests: Wildlife conservation, flying, boating, fishing
Future: Control my practice and do more of the above
Office: 1200 Euclid Ave., Suite 102, Sioux Falls, SD 57105 (605/336-2638)
Home: 405 Harpel Dr., Sioux Falls, SD 57105 (605/339-4429)

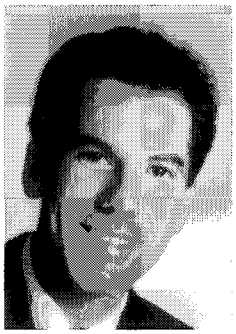
Carl A. Andrews, M.D.
Education: M.D., University of Illinois, 1970; UW Orthopædics, 1977
Office: Everett Orthopædic and Fracture Clinic, 4301 Hoyt Ave., Everett, WA 98203
Home: 602 Campbell, Mukilteo, WA 98275 (206/353-9648)

Craig T. Arntz, M.D.
Education: M.D., University of Washington, 1981; UW Orthopædics, 1987; fellowships in hand surgery at Malmo, Sweden (7/87–12/87), and shoulder/elbow at UWMC (1/88–7/89)
Practice: Upper extremity, shoulder/hand; appointment at Valley Medical Center
Affiliations: Acting clinical instructor, UW Department of Orthopædics
Family: Spouse: Josie; children: Betsy, Jamey, Bryan, Kristi, Amanda
Interests: Golf, tennis, skiing
Office: Valley Orthopædic Associates, 4011 Talbot Rd. S., Suite 300, Renton, WA 98055 (206/226-6900)
Home: 1405 SW 152nd St., Seattle, WA 98166 (206/524-4930)

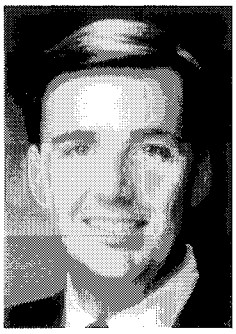
Allan W. Bach, M.D.
Education: M.D., University of Nebraska, 1975; UW Orthopædics, 1979
Practice: Hand surgery, microvascular surgery; appointments at Swedish, UW Medical Center, Harborview, Children's Hospital, Providence, Group Health, Valley Medical Center
Affiliations: Clinical associate professor, University of Washington
Family: Spouse: Carol; children: David, Mike
Interests: Climbing, cycling, skiing
Future: Help in the solution of environmental problems rather than being part of the problem
Office: 801 Broadway, Suite 701, Seattle, WA 98122 (206/292-6252)
Home: 4225 NE 89th, Seattle, WA 98115 (206/524-5064)

William M. Backlund, M.D.
Education: M.D., Baylor University, 1967; UW Orthopædics, 1975
Practice: Spine
Family: Spouse: Pat; children: Amy, Pam
Interests: Tennis, running, politics, church
Future: Limit practice, more involvement in church and civic affairs
Office: 1515–116th Ave. NE, Suite 307, Bellevue, WA 98004 (206/462-0982)
Home: 8055–171 Ave. NE, Redmond, WA 98052 (206/883-0144)

Samuel R. Baker, M.D.
Education: M.D., University of Washington, 1966; UW Orthopædics, 1974
Practice: Arthroscopy of the knee
Family: Spouse: Martha; children: Scott, Hana
Interests: Hiking, kayaking, cross-country skiing, biking with family
Future: Stay where we are
Office: 1004 Caroline St., Port Angeles, WA 98362 (206/457-0491)
Home: 893-B Mt. Angeles Rd., Port Angeles, WA 98362 (206/457-6936)



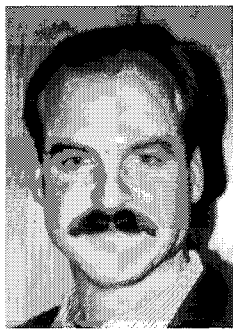
William P. Barrett, M.D.
Education: M.D., University of Southern California, 1980; UW Orthopædics, 1985; fellowship at Harvard Medical School & Brigham and Womens Hospital, 7/85–6/86
Practice: Adult reconstruction, joint replacement surgery; appointment at Valley Medical Center
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Lauren; children: Blake, Maxwell
Interests: Skiing, waterskiing, fishing, spending time with family
Future: Continue at Valley Orthopædic Associates, travel, and take lots of vacation
Office: Valley Orthopædic Associates, 4011 Talbot Rd. S., Suite 300, Renton, WA 98055 (206/226-6900)
Home: 1615–39th Ave. E., Seattle, WA 98112 (206/328-6501)



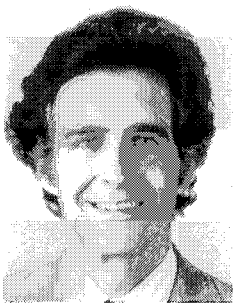
Richard J. Barry, M.D.
Education: M.D., University of Mississippi, 1980; UW Orthopædics, 1985
Practice: General orthopædics, spine, adult reconstructive surgery, aviation medicine; appointments at Sutter Davis Hospital, Woodland Memorial Hospital, Vaca Valley Hospital, North Bay Medical Center, UCD Cowell Student Health Center
Family: Children: Ryan Joseph, Lauren Ann
Interests: Flying, skiing, sailing, running
Office: 2031 Anderson Rd., Suite A, Davis, CA 95616 (916/756-2221)
Home: 3906 Solar Hills Dr., Vacaville, CA 95688 (707/451-1108)

John R. Beebe, M.D.
Education: M.D., University of Iowa, 1943; UW Orthopædics, 1957
Practice: Retired, former practice in general orthopædics; past appointments at Swedish, Providence, Harborview, Ballard, Northwest, Northgate, Doctor's
Family: Spouse: Josephine; children: John Jr., Jeanne, Patricia (all UW grads); 7 grandchildren
Interests: Pomology, photography, flying, skiing, fishing, own 18-acre apple orchard in Chelan area
Future: Continue present activities
Home: 6326 NE 124th, Kirkland, WA 98033 (206/823-5157)

Gary Bergman, M.D.
Education: M.D., University of California-San Diego, 1981; UW Orthopædics, 1986
Practice: General orthopædics, trauma, hand; appointments at Doctor's Medical Center, Memorial Hospital Association, Emanuel Medical Center
Family: Spouse: Colleen; children: Cory, Andrew, Daniel
Interests: Skiing, sailing, golf
Future: Manage to support three kids through college; return to the Northwest
Office: Modesto Orthopædic Group, 1500 Florida Ave., Modesto, CA 95350 (209/577-2200)
Home: 1319 Edgebrook, Modesto, CA 95390 (209/579-7206)



Robert M. Berry, M.D.
Education: M.D., University of Southern California, 1978; UW Orthopædics, 1983
Practice: Spinal reconstruction; appointments at Cottonwood Medical Center (SLC), Utah Valley Medical Center (Provo)
Family: Spouse: Gail; children: Matt, Katie
Interest: Fly fishing, skiing, farming
Future: To fly fish, ski, and farm
Office: Cottonwood Spine Institute, 5770 South 250 East, Suite 310, Salt Lake City, UT 84107 (801/241-3642)
Home: 975 East 920 North, Alpine, UT 84004 (801/756-8376)



Stephen A. Bezruchka, M.D.
Education: M.D., Stanford, 1973; UW Orthopædics, 1978-1979
Practice: Emergency medicine, interests in travel medicine, mountaineering medicine, international health
Family: Children: Michael
Interests: Mountaineering, writing (author of *Trekking in Nepal*), photography
Office: Providence Hospital, 500 17th Ave., Seattle, WA 98124 (206/326-5691)
Home: 2030 Bonair Dr. SW, Seattle, WA 98116 (206/932-4928)

Ivar W. Birkeland, Jr., M.D.
Education: M.D., University of Washington, 1959; UW Orthopædics, 1967
Practice: Appointments at Swedish and Providence
Affiliations: Clinical assistant professor, University of Washington
Family: Spouse: Joanne; eight children aged 19 to 32
Interests: Skiing, fishing, sailing, and getting lost in Desolation Sound
Future: Will retire sometime and build furniture and wooden boats
Office: Orthopedics International, Ltd., P.S., 1600 East Jefferson St., Suite 400, Seattle, WA 98122 (206/323-1900)
Home: 1133 McGilvra Blvd. E., Seattle, WA 98112 (206/322-5287)

Alfred I. Blue, M.D.
Education: M.D., University of Arkansas, 1955; UW Orthopædics, 1963
Practice: Appointments at Swedish and Stevens
Interests: Fishing, travel
Office: Seattle Plastic Surgeons, Inc., 1221 Madison Ave., Suite 1520, Seattle, WA 98104 (206/292-6226)
Home: 1994 Shehandoah Dr. E., Seattle, WA 98112 (206/324-4369)

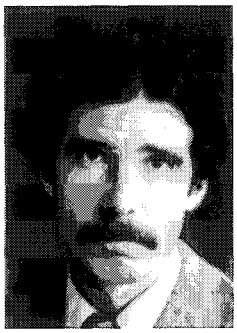
Bruce E. Bradley, Jr., M.D.
Education: M.D., University of Virginia, 1962; UW Orthopædics, 1971
Affiliations: Clinical associate professor, University of Washington
Office: 801 Broadway, 10th Floor, Seattle, WA 98122 (206/292-7550)
Home: 4216–55th Ave. NE, Seattle, WA 98105 (206/524-9142)

Steven T. Bramwell, M.D.
Education: M.D., University of Washington, 1971; UW Orthopædics, 1977
Office: Washington Sports Medicine & Orthopædics, 11821 NE 128th St., Kirkland, WA 98034 (206/823-8282)
Home: 16604 NE 145th, Woodinville, WA 98072 (206/483-6578)

John W. Brantigan, M.D.
Education: M.D., Johns Hopkins, 1970; UW Orthopædics, 1978
Office: 450 East 23rd St., Fremont, NE 68025 (402/727-8619)
Home: 2108 Bramblewood Lane, Fremont, NE 68025 (402/721-2334)

William D. Burman, M.D.
Education: M.D., Albany Medical College, 1975; UW Orthopædics, 1982
Address: Box 442, Vermontville, NY 12989

John F. Burns, M.D.
Education: M.D., Georgetown University, 1967; UW Orthopædics, 1976
Affiliations: Clinical associate professor, University of Washington
Office: 1145 Broadway, Seattle, WA 98122 (206/329-1760)
Home: 820–34th Ave. E., Seattle, WA 98112 (206/329-7725)
Family: Spouse: Carol



Gary J. Clancey, M.D.
Education: M.D., Case Western Reserve University, 1973; UW Orthopædics, 1978
Practice: Trauma, upper extremity; appointments at Skagit Valley Hospital in Mount Vernon and Island Hospital in Anacortes; courtesy staff at United General Hospital in Sedro Woolley, Whidbey General Hospital in Coupeville, and Harborview Medical Center
Family: Spouse: Paula; children: Erin, Owen
Interests: Water, wind, mountains, music, travel
Future: Carpe diem.
Office: 1311 East Division St., Mount Vernon, WA 98273 (206/424-7041)
Home: 127 Green Cliff Lane, Anacortes, WA 98221 (206/293-7403)

Herbert R. Clark, M.D.
Education: M.D., University of North Carolina, 1982; UW Orthopædics, 1987
Practice: Sports medicine, foot and ankle; appointments at Northwest Hospital, Stevens Memorial, Ballard, Children's Hospital
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Lynn
Interests: Jogging, tennis, gardening, skiing
Future: Private practice, family, travel abroad
Office: 1530 North 115th St., Suite 104, Seattle, WA 98133 (206/365-8444)
Home: 9820 Cherry St., Edmonds, WA 98020

John Monte Clark, Jr., M.D., Ph.D.
Education: M.D., Pritzker School of Medicine, 1976; Ph.D. (anatomy), University of Chicago, 1975; UW Orthopædics, 1981; fellowship in joint replacement with Mr. M.A.R. Freeman, London, 1982
Practice: Associate professor, University of Washington; joint replacement, other aspects of joint surgery; appointments at University of Washington Medical Center, Harborview, Children's Hospital
Family: Children: Andrew
Interests: Squash
Office: Dept. of Orthopædics, RK-10, University of Washington, 98195 (206/543-3690)
Home: 210 McGraw, Seattle, WA 98109 (206/281-7875)

Joseph C. Clifford, M.D.
Education: M.D., University of Washington, 1961; UW Orthopædics, 1967
Office: 3420-B Kwhio Highway, Lihue, HI 96766 (808/245-1523)
Home: 5793 Ha'Aheao St., Kapha, HI 96741 (808/822-9555)

Samuel L. Clifford, M.D.
Education: M.D., Vanderbilt University, 1953; UW Orthopædics, 1958
Office: 14 West Jordan St., Pensacola, FL 32501 (904/433-8252)

Robert C. Colburn, M.D.
Education: M.D., University of Washington, 1952; UW Orthopædics, 1960
Family: Spouse: Elizabeth; children: now adults
Future: Trying to maintain a practice in freedom and opposing the bureaucrats
Office: Bryden Canyon Center, 320 Warner Dr., Lewiston, ID 83501
Home: 4093 Fairway Dr., Lewiston, ID 83501 (208/743-9228)

John M. Coletti, Jr., M.D.
Education: M.D., Cornell University Medical College, 1964; UW Orthopædics, 1970
Office: 349 SE 7th St., Hillsboro, OR 97123 (503/648-0803)

F. Richard Convery, M.D.
Education: M.D., University of Washington, 1958; UW Orthopædics, 1966
Practice: Professor, University of California-San Diego; joint reconstruction and cartilage allografting; appointment at UCSD
Medical Center
Family: Spouse: Martha Minteer-Convery, M.D.; children: Kristine Helen, Linda Lea, Mark Richard
Interests: Skiing, landscaping
Future: Retire on Bainbridge Island
Office: Division of Orthopædic Surgery, UCSD, 225 West Dickinson St., San Diego, CA 92103 (619/543-5632)
Home: 5772 La Jolla Corona, La Jolla, CA 92037 (619/459-1443)

James P. Crutcher, M.D.
Education: M.D., University of Washington, 1984; UW Orthopædics, 1989
Practice: Joint reconstruction, knee surgery; appointments in Phoenix at St. Lukes Medical Center, Good Samaritan Medical Center, Scottsdale Memorial Hospital; after July 1990 at Swedish Hospital in Seattle
Family: Spouse: Jill; children: Elizabeth
Interests: Skiing, biking, hiking, music
Future: Return to Seattle in July 1990 to begin orthopædic practice
Office: Institute for Bone and Joint Disorders, 3320 North 2nd St., Osborn Plaza, Phoenix, AZ 85012 (602/266-6390) – till 6/30/90
Home: 4735–36th Ave. NE, Seattle, WA 98105 (206/524-6222)

Douglas T. Davidson, M.D.
Education: M.D., University of Pennsylvania, 1970; UW Orthopædics, 1976
Practice: Arthroscopy, general orthopædics; appointments at Providence and General Hospital in Everett
Family: Spouse: Judy; children: Kate, Matt, Jennie
Interests: Mountaineering, fishing, sailboard
Future: Same
Office: 4301 Hoyt Ave., Everett, WA 98203 (206/258-4531)
Home: 5111–23rd Ave. W., Everett, WA 98203 (206/355-6053)

Frederick J. Davis, M.D.
Education: M.D., Dalhousie Medical School, 1968; UW Orthopædics, 1973
Practice: General orthopædics; appointment at Highline Community Hospital
Family: Spouse: Dottie; children: Adrienne, Raquel
Interests: Skiing, yachting, travel, teaching success principles to eager students
Future: More time with family and friends, less time with patient care
Office: 13100 Military Rd., Suite 2, Seattle, WA 98168 (206/246-6881)
Home: 19626 Marine View Dr. SW, Seattle, WA 98166 (206/824-4744)

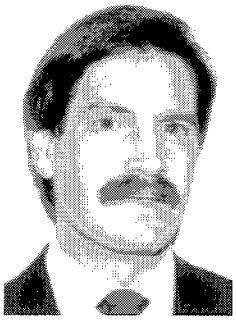
Richard A. Dimond, M.D.
Education: M.D., University of Iowa, 1966; UW Orthopædics, 1974
Practice: General orthopædics, foot problems, total joints, shoulder problems
Affiliations: Clinical assistant professor, University of Washington; appointments at Harborview and Children's Hospital
Family: Spouse: Brenda; children: Holly, Devrie
Interests: Swimming, hiking, photography, jazz music, real estate, autos
Future: Continue practice at GHC until age 60; travel; real estate acquisitions
Office: Group Health Hospital, 200–15th Ave. E., Seattle, WA 98112 (206/326-3150)
Home: 4318–55th Ave. NE, Seattle, WA 98105

Andrew B. Dott, III, M.D.
Education: M.D., Columbia University, 1968; UW Orthopædics 1971–1972
Office: 479 Lowerline St., New Orleans, LA 70118 (504/861-0163)

J. Michael Egglin, M.D.
Education: M.D., Julius Maximilians University, 1944; UW Orthopædics, 1956
Home: 18230 Terrace Ct. SW, Seattle, WA 98166 (206/244-5030)

Gregory M. Engel, M.D.
Education: M.D., University of Washington, 1974; UW Orthopædics, 1979
Family: Spouse: Karen; children: Max, Madeline
Interests: Skiing, water skiing, tennis
Office: 1632–116th Ave. NE, Suite C, Bellevue, WA 98004 (206/462-9800)
Home: 906 1st Street South, Kirkland, WA 98033 (206/4277)

Nancy J. Ensley, M.D.
Education: Medical College of Virginia, 1984; UW Orthopædics, 1989; fellowship in pediatric orthopædics at Vanderbilt University, 6/89–6/90
Practice: Pediatric orthopædics; appointments at Vanderbilt University Hospital, Nashville General Hospital
Interests: Badminton, running, cycling (just completed a 160-mile ride), CD collecting
Future: Academic practice in pediatric orthopædics; badminton, running, cycling, CD collecting
Office: Orthopædics and Rehabilitation, Vanderbilt University Medical Center, Nashville, TN 37232 (615/322-7133)
Home: 231 Village at Vanderbilt, Nashville, TN 37212 (615/321-4535)



Edward L. Farrar, M.D.
Education: M.D., Emory University, 1978; UW Orthopædics, 1983
Practice: General orthopædics with interest in spine; appointments at Central Washington Hospital, Mid Valley Hospital, Lake Chelan Community Hospital, Swedish Hospital (Seattle)
Family: Spouse: Cindy; children: Scott, Tyler
Interests: Mountaineering, trekking, outdoor sports, travel; volunteer services in mountainous developing countries
Future: Continuation of private practice, education in spine surgery, work with Orthopedics Overseas
Office: Wenatchee Orthopædics, 520 N. Chelan, Wenatchee, WA 98801 (509/662-2211)
Home: 1385 Westview, Wenatchee, WA 98801 (509/663-2378)

Nils Fauchald, Jr., M.D.
Education: M.D., University of Washington, 1963; UW Orthopædics, 1971
Office: The Interstate Medical Center, Highway 61 West, Red Wing, MN 55066 (612/388-2210)

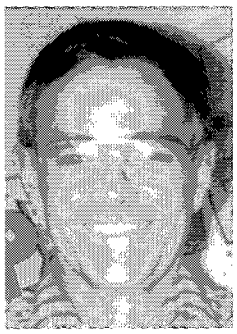
Thomas J. Fischer, M.D.
Education: M.D., Indiana University, 1979; UW Orthopædics, 1984
Practice: Hand and upper extremity, fracture fixation techniques, reconstructive microsurgery, upper extremity vascular problems; appointments at Surgery Center of Hand Surgery Associates, St. Vincent Hospital and Health Care, Indiana University Hospitals, Methodist Hospital, Wishard Hospital, Richard L. Roudebush VA Hospital
Family: Spouse: Maribeth; children: Andy, Katie, Sarah, James Patrick
Interests: Canoeing, biking, camping
Future: Continue practice in Indianapolis; development of fellowship bioskills program

Office: 8501 Harcourt Rd., PO Box 80434, Indianapolis, IN 46280 (317/875-9105)
Home: 1828 Box Elder Ct., Indianapolis, IN 46260

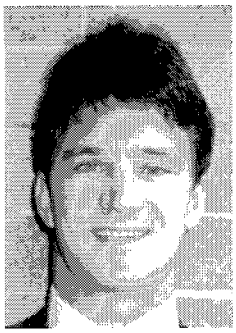
Robert W. Florence, M.D.
Education: M.D., University of Oklahoma, 1941; UW Orthopædics, 1955
Practice: Retired
Home: 66 Hewitt Dr., Steilacom, WA 98388 (206/627-7157)

Daniel L. Flugstad, M.D.
Education: M.D., University of Washington, 1980; UW Orthopædics, 1985; fellowship in musculoskeletal oncology at Massachusetts General Hospital
Practice: Appointments at Swedish, Virginia Mason, Providence, Group Health Central
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Cheryl; children: Matthew, Nicholas, Jonathan
Interests: Water sports, family activities, skiing, photography
Future: Continue with present practice
Office: 1145 Broadway, Seattle, WA 98122 (206/329-1760)
Home: 16454 NE 135th St., Redmond, WA 98052 (206/869-2248)

Trygve Forland, M.D.
Education: M.D., Long Island College of Medicine, 1948; UW Orthopædics, 1954
Office: 115 Dean Dr., Suite A, Santa Paula, CA 93060 (805/525-2118)



Harold J. Forney, M.D.
Education: M.D., Stanford University, 1956; UW Orthopædics, 1964
Practice: General orthopædics with emphasis on trauma, interest in amputations and prosthetics; appointments at Sharp Memorial Hospital, Children's Hospital and Health Center, Scripps Memorial Hospital, Mercy Hospital
Affiliations: Associate clinical professor, University of California-San Diego; chief of Amputation Service, VA Medical Center, La Jolla
Family: Spouse: Elizabeth; children: Doug, Anne, Liza, Donna; 7 grandchildren
Interests: Family, church, travel, gardening, skiing, water skiing, distance running
Future: In the past 11 years I have taken volunteer assignments in Nigeria, Somalia, Korea, Zaire, Pakistan, and Armenia, and would like to continue and expand such work, especially after retirement in 3-5 years.
Office: 7930 Frost St., Suite 206, San Diego, CA 92123 (619/560-6001)
Home: 5669 Bounty St., San Diego, CA 92120 (619/286-3169)



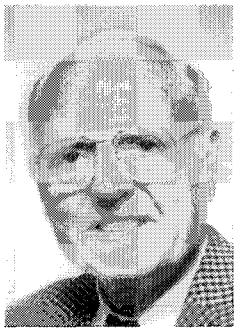
Jonathan L. Franklin, M.D.
Education: M.D., University of Washington, 1983; UW Orthopædics, 1988; fellowship training in knee, shoulder, and sports medicine through the University of Utah, 1988-89
Practice: Appointments at Ballard, Swedish
Family: Spouse: Cynthia
Interests: Skiing, tennis, sailing, outdoors
Office: Ballard Orthopedic and Fracture Clinic, 1801 NW Market St., Suite 403, Seattle, WA 98107 (206/784-8833)
Home: 7315–18th Ave. NE, Seattle, WA 98115 (206/524-9931)

Jeffrey B. Friedman, M.D.
Education: M.D., Mount Sinai School of Medicine, 1985; UW Orthopædics, 1987-1989; orthopædic surgery residency at Montefiore Medical Center, will graduate 6/93
Practice: Interest in total joints and sports medicine, but still too early to decide
Family: Spouse: Robin
Interests: Skiing, basketball, golf, backgammon, travel, photography
Future: Fellowship; undecided on private vs. academic practice

Office: Montefiore Medical Center, Dept. of Orthopædics, 111 East 210th St., Bronx, NY 10467 (212/920-4961)
Home: 3450 Wayne Ave., Apt. 22-D, Bronx, NY 10467 (212/231-7111)

James R. Friend, M.D.
Education: UW Orthopædics, 1958
Office: 1921–18th St., Bakersfield, CA 93301 (805/324-4780)

Michael K. Gannon, M.D.
Education: M.D., University of Iowa, 1982; UW Orthopædics, 1987
Practice: General orthopædics; appointments at 97th General Hospital, Frankfurt; Berlin Army Hospital, Bremerhaven Army Hospital
Interests: Skiing, tennis, travel, golf
Future: After fulfilling my military commitment
I hope to join a group practice in the Northwest in 1991.
Office: Box 33, 97th General Hospital, APO New York, NY 09757 (W. Ger: 69-1541-7566)
Home: Gronauer Weg #32, 6368 Bad Vilbel, West Germany (6101-88496)



Park W. Gloyd, M.D.
Education: M.D., University of Pennsylvania, 1948; UW Orthopædics, 1952
Practice: General orthopædic surgery; appointments at Ballard, Swedish, Virginia Mason, Children's Hospital
Affiliations: Clinical professor, University of Washington
Interests: Sailing, skiing, travel
Future: Continue the same
Office: 1221 Madison, Suite 1012, Seattle, WA 98104 (206/622-6522)
Home: 3415 Hunts Point Rd., Bellevue, WA 98004 (206/455-4580)

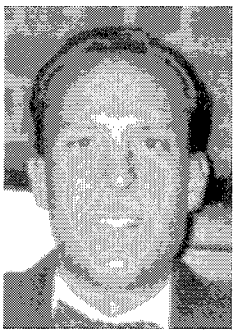
John E. Goeckler, M.D.
Education: UW Orthopædics, 1956
Practice: Retired
Home: 2141 Maple Way Rd., Yakima, WA 98909 (509/966-4667)

Thomas M. Green, M.D.
Education: M.D., University of Washington, 1969; UW Orthopædics, 1975
Affiliations: Clinical professor, University of Washington
Office: Virginia Mason Clinic (C5-N), 1100 Ninth Ave., Seattle, WA 98101 (206/223-6655)
Home: 6850–35th Ave. NE, Seattle, WA 98115 (206/524-2668)

Theodore K. Greenlee, Jr., M.D.
Education: M.D., Northwestern University, 1959; UW Orthopædics, 1964; fellowship in experimental pathology, University of Washington, 1964-66
Practice: Associate professor, University of Washington; chief, Orthopædic Section, VA Medical Center; staff appointments at VAMC, Harborview, Children's Hospital
Family: Spouse: Sandra; children: Donna Sue, Laurie Ann, Paul David
Office: Veterans Administration Medical Center, Orthopædics (112 ORT), ZB-20, 1660 South Columbian Way, Seattle, WA 98108 (206/762-1010, ext. 1095)
Home: 20510 NE 150th, Woodinville, WA 98072 (206/882-0817)

Thomas Lehman Gritzka, M.D.
Education: M.D., Harvard Medical School, 1963; UW Orthopædics, 1972
Practice: Occupational orthopædics; appointments at Emanuel Hospital
Family: Spouse: Karen; children: Aaron, Didrik
Interests: Fishing, skiing, boating
Future: Continue in occupational orthopædics

Office: Occupational Orthopædics, 7525 SE 29th, Portland, OR 97202 (503/774-2331)
Home: Same address (503/774-8494)

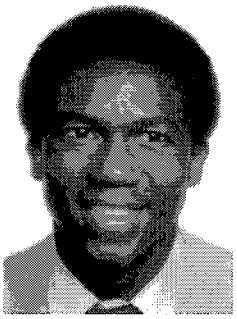


Jeffrey N. Hansen, M.D.
Education: M.D., University of Washington, 1969; UW Orthopædics, 1985; fellowship in hand surgery, Gothenburg, Sweden
Practice: Appointments at Saint Vincent Hospital, Deaconess Hospital
Interests: Golf, skiing, fly fishing, travel
Future: I measure success by the quality of home and family life and my plan for the future is to seek such success.
Office: Orthopædic Associates, 1145 North 29th St., Suite 100, Billings, MT 59101 (406/259-5521)
Home: 4305 Loma Vista, Billings, MT 59106 (406/656-9581)

Sigvard T. (Ted) Hansen, Jr., M.D.
Education: M.D., University of Washington, 1961; UW Orthopædics, 1969
Practice: Professor, University of Washington; interests in traumatology (lower extremity), foot and ankle reconstruction, amputation, prosthetic research; appointments at Harborview (orthopædist-in-chief since 1973), UWMC, VA Hospital, Children's Hospital
Family: Spouse: Dalia; children: Chris, Eric (UWSOM '90); Dalia's children: Daina, Kima
Interests: Travel, skiing, tennis, golf
Future: Less travel, work; more writing
Office: Harborview Medical Center, Orthopædics, ZA-48, 325 Ninth Ave., Seattle, WA 98104 206/223-8053)
Home: One West Highland Dr., Seattle, WA 98119 (206/285-6856)

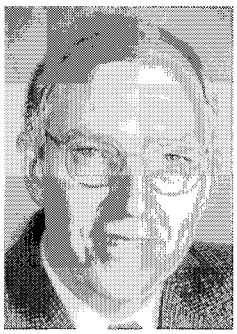
John Martin Hendrickson, M.D.
Education: M.D., University of Florida, 1975; UW Orthopædics, 1980
Practice: Sports medicine, arthroscopic surgery, adult and pediatric trauma; appointments at Valley Medical Center, Children's Hospital
Affiliations: Clinical assistant professor, University of Washington
Family: Spouse: Susan; children: John III, Casey
Interests: Alpine and cross-country skiing, water skiing, windsurfing, cycling, fishing
Future: To continue practicing in this growing and dynamic area
Office: Valley Orthopædic and Fracture Clinic, 4011 Talbot Rd. S., Suite 300, Renton, WA 98055 (206/226-6900)
Home: 3140 E. Laurelhurst Dr. NE, Seattle, WA 98105 (206/527-8106)

Einar Henriksen, M.D.
Education: UW Orthopædics, 1950
Practice: Retired
Affiliations: Clinical consultant, University of Washington
Home: 13713–42nd Pl. NE, Seattle, WA 98125 (206/362-8702)



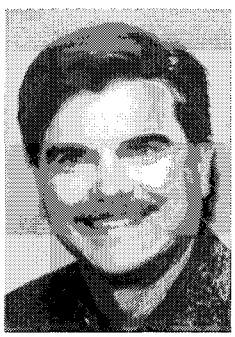
Lawrence E. Holland, M.D.
Education: M.D., UCLA, 1981; UW Orthopædics, 1986
Practice: Sports medicine and general orthopædics; appointments at Swedish, Providence, Children's Hospital
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Toni; children: Lauren, Christopher, Alexander
Interests: Amateur radio, computers, running, fishing, "audiophile"
Future: More of the same
Office: 1229 Madison, Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 9115 SE 54th St., Mercer Island, WA 98040 (206/232-5120)

Donald Dale Hubbard, M.D.
Education: M.D., Washington University, 1965; UW Orthopædics, 1972
Office: 4300 Talbot Rd. S., Suite 401, Renton, WA 98055
Home: 8279 West Mercer Way, Mercer Island, WA 98040 (206/232-5383)

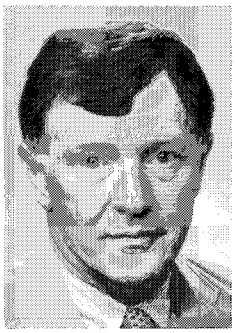


Larry D. Hull, M.D.
Education: M.D., University of Washington, 1964; UW Orthopædics, 1973
Practice: Sports medicine, knee disorders; appointments at Providence Hospital in Centralia, Willapa Harbor Hospital in South Bend, St. Peter Hospital in Olympia
Family: Spouse: Aarlie; children: L.D. Jr., Heather, Amy, Bethany, Dean
Office: Washington Orthopædic and Fracture Clinic, 1900 Cooks Hill Rd., Centralia, WA 98531 (206/736-2889)
Home: 166 Summerside Dr., Centralia, WA 98531 (206/736-5881)

Stuart R. Hutchinson, M.D.
Education: M.D., Stellenbosch University, South Africa; UW Orthopædics, 1980
Practice: Spine; appointments at St. Francis Hospital (department chairman), Cottage Hospital, Goleta Hospital
Family: Spouse: Cinders; children: Amanda, Tegan, Stuart, Samantha
Interests: Golf, running, family
Office: 536 East Arrelaga St., Suite 101, Santa Barbara, CA 93103 (805/963-9377)
Home: 647 Searanch Dr., Santa Barbara, CA 93109 (805/682-8815)



Larry D. Iversen, M.D., F.A.C.S.
Education: M.D., University of Washington, 1970; UW Orthopædics, 1977
Practice: General orthopædics, special interests in total joint replacement and sports medicine; appointments at Harrison Memorial, Harborview, Swedish, UW Medical Center, Children's Hospital
Affiliations: Clinical assistant professor, University of Washington
Family: Spouse: Peggy; children: Brett, Paige, Brooke
Interests: Water skiing, snow skiing, travel, business interests
Future: Spending July 1990 on the island of St. Lucia working with Orthopedics Overseas; in general, less work and more freedom and travel
Office: 2600 Wheaton Way, Suite 311, Bremerton, WA 98310 (206/479-2003)
Home: 9196 Utah St. NE, Bremerton, WA 98310 (206/692-1079)



David E. Karges, M.D.
Education: M.D., Indiana University, 1955; UW Orthopædics, 1964
Practice: General orthopædics with emphasis on foot and lower extremity problems; appointments at Swedish, Children's Hospital
Affiliations: Clinical associate professor, University of Washington
Family: Spouse: Gail
Interests: Woodworking, fishing
Future: Retirement in two to three years
Office: Orthopædic Physicians, Inc., 1229 Madison Ave., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 3124 East Laurelhurst Dr. NE, Seattle, WA 98105 (206/522-9106)

Carleton Keck, M.D.
Education: M.D., Indiana University, 1981; UW Orthopædics, 1986
Practice: Hand and upper extremity surgery, microvascular surgery; appointments at Harborview, UW Medical Center, Children's Hospital, Swedish, Ballard, Cabrini, Providence
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Martha; children: Corky, John
Interests: Music, cycling, mountaineering, skiing

Future: No change
Office: 801 Broadway, Suite 701, Seattle, WA 98122 (206/292-6252)
Home: 6849–50th NE, Seattle, WA 98115 (206/542-2742)

Douglas K. Kehl, M.D.
Education: M.D., University of Utah, 1975; UW Orthopædics, 1975-1976
Office: 1001 Johnson Ferry Rd., Atlanta, GA 30363 (404/255-1933)
Home: 1314 Vernon North Dr., Dunwitty, GA 30338 (404/396-2237)

Richard M. Kirby, M.D.
Education: M.D., University of Washington, 1977; UW Orthopædics, 1982
Practice: Shoulder surgery, pediatric trauma; appointments at Providence, Swedish, West Seattle (chief of staff elect), Children's Hospital
Affiliations: Clinical assistant professor, University of Washington
Family: Spouse: Betsy; children: Anna, Laura
Interests: Windsurfing, skiing, playing with my girls
Future: More of the same
Office: 2460 SW Holden St., Suite 12, Seattle, WA 98126 (206/935-2544)
Home: 5656 NE Keswick Dr., Seattle, WA 98105 (206/523-0384)

Jonathan L. Knight, M.D.
Education: M.D., Dartmouth Medical School (1967-69), University of Washington, 1971; UW Orthopædics, 1979
Practice: Lower extremity reconstructive surgery, osteotomy/total hip and knee arthroplasty
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Linda Quan; children: Margot, Katryn, Jonathan
Interests: Bicycle racing, woodworking, gardening
Future: Arthroplasty computerized database
Office: Group Health Hospital, 2700–152nd Ave. NE, Redmond, WA 98052 (206/883-5783
Home: 16061 SE 16th St., Bellevue, WA 98008 (206/643-0722)

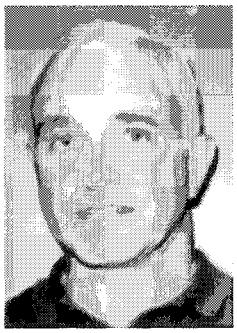
Gunter Knittel, M.D.
Education: M.D., University of Giessen Germany, 1967; UW Orthopædics, 1975
Office: Fachartz Fur Orthopadie, Bahnhofstrasse #23, D 8207 Endorf, German Democratic Republic

Robert A. Kraft, M.D.
Education: M.D., University of Washington, 1953; UW Orthopædics, 1963
Office: 331 Sanel Dr., Ukiah, CA 95482 (707/462-6012)

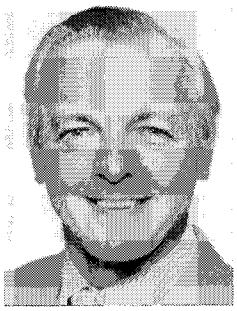
Harry H. Kretzler, Jr., M.D.
Education: M.D., University of Pennsylvania, 1951; UW Orthopædics, 1958
Affiliations: Clinical associate professor, University of Washington
Office: Orthopædic Surgery & Fractures, 1501 North 200th, Seattle, WA 98133 (206/542-2123)
Home: 6850 51st St. NE, Seattle, WA 98115 (206/524-4708)

Dennis J. Kvidera, M.D.
Education: M.D., University of Iowa, 1976; UW Orthopædics, 1981
Practice: Athletic injuries, trauma; appointments at Swedish, Providence
Affiliations: Clinical Instructor, University of Washington
Family: Spouse: Linda; children: Jared, Jordan
Interests: Tennis, skiing, investments, neighborhood association
Future: Travel, provide for children's education, involvement with physicians' insurance

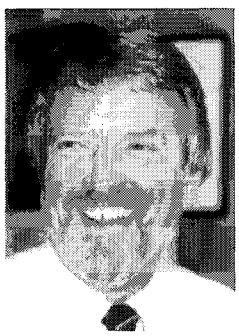
Office: First Hill Medical Building, 515 Minor Ave., Suite 110, Seattle, WA 98104 (206/623-2399)
Home: 14405 SE 56th St., Bellevue, WA 98006 (206/644-9729)



David J. LaGasse, M.D.
Education: M.D., Cornell University, 1964; UW Orthopædics, 1972
Practice: Appointments at Tuality Community Hospital (Hillsboro), St. Vincent's Hospital (Portland)
Family: Spouse: Mindy
Office: Hillsboro Orthopædic Group, 349 Southeast 7th St., Hillsboro, OR 97123 (503/648-0803)
Home: Portland (503/297-3805)

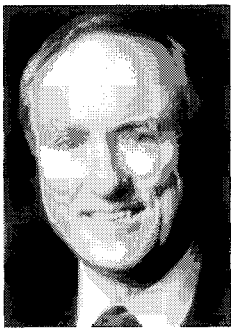


Edward L. Lester, M.D.
Education: M.D., University of Washington, 1960; UW Orthopædics, 1969
Practice: Pediatric orthopædics, arthroscopy, total joints; appointments at Shriners Hospital for Crippled Children (chief of staff), Deaconess, St. Luke's, Sacred Heart
Affiliations: Clinical associate professor, University of Washington
Family: Spouse: Kay
Interests: Gardening, fishing, hiking
Future: Bringing new Spokane Shriners Hospital on line in spring 1991
Office: 226 Medical Center Bldg., South 820 McClellan, #226, Spokane, WA 99204 (509/747-3107)
Home: 604 High Drive E., Spokane, WA 99203 (509/838-2862)



Malcolm B. (Mac) Madenwald, M.D.
Education: M.D., University of Washington, 1964; UW Orthopædics, 1970
Practice: General orthopædics, Orthopedics Overseas; appointments at Island Hospital, Skagit Valley Hospital, United General
Family: Spouse: Darlene; children: Tamra, Marc
Interests: Sailing, travel, skiing
Future: More of the same
Office: 1311 East Division St., Mount Vernon, WA 98273 (206/424-7041)
Home: 629 Slice St., Anacortes, WA 98221 (206/293-6453); 2235 Fairview Ave E., #7, Seattle, WA 98102 (206/324-2217)

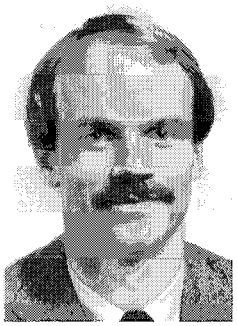
Martin G. Mankey, M.D.
Education: M.D., Chicago Medical School, 1984; UW Orthopædics, 1989
Practice: Foot and ankle; appointment at Swedish
Family: Spouse: Diane; children: Austin, Danielle, Alexandra
Future: Fellowship in foot and ankle with Dr. Roger Mann in San Leandro, CA beginning in July 1990
Office: 1229 Madison St., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 4354 NE 58th St., Seattle, WA 98105 (206/525-1839)



Kenneth L. Martin, M.D.
Education: M.D., University of Oregon, 1950; UW Orthopædics, 1958
Practice: General orthopædics; appointment at Highline Community Hospital
Affiliations: Clinical associate professor, University of Washington
Interests: Everything in moderation
Future: Retirement to enjoy everything almost as much as orthopædics
Office: 16259 Sylvester Rd. SW, Seattle, WA 98166 (206/243-1100)
Home: 18541 Normandy Terr. SW, Seattle, WA 98166 (206/243-8902)

Frederick A. Matsen III, M.D.
Education: M.D., Baylor University, 1968; UW Orthopædics, 1975
Practice: Professor and chair, UW Department of Orthopædics; interests in shoulder and elbow; appointments at UW Medical Center, Harborview, VA Hospital, Children's Hospital
Family: Spouse: Anne; children: Susanna, Erick, Laura Jane

Interests: My family, hiking, nordic skiing, sea kayaking, bicycling, windsurfing
Future: Continuing the tradition of excellence in the Department of Orthopædics
Office: Dept. of Orthopædics, RK-10, University of Washington, Seattle, WA 98195 (206/543-5450)
Home: 1853 East Hamlin, Seattle, WA 98112

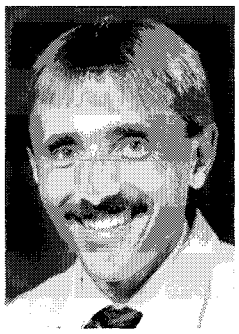


Keith A. Mayo, M.D.
Education: M.D., University of Washington, 1978; UW Orthopædics, 1983
Practice: Assistant professor, UW Department of Orthopædics; interests in hip and knee arthritis; appointments at Harborview,
UW Medical Center, VA Hospital, Pacific Medical Center
Interests: Skiing, cycling, outdoor activities
Office: Dept. of Orthopædics, Harborview Medical Center, ZA-48, 325 Ninth Ave., Seattle, WA 98104 (206/223-3466)
Home: 9249 Fauntleroy Way SW, Seattle, WA 98136 (206/937-2559)

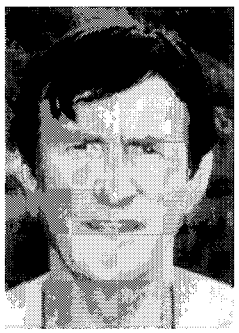
Peter Melcher, M.D.
Education: UW Orthopædics, 1976

Robert R. Mensendiek, M.D.
Education: M.D., Washington University, 1956; UW Orthopædics, 1963

Joseph F. Mezistrano, M.D.
Education: M.D., University of Washington, 1960; UW Orthopædics, 1966
Office: 16259 Sylvester Rd. SW, Seattle, WA 98166 (206/243-9066)
Home: 5352 South Kenyon, Seattle, WA 98166 (206/723-3514)



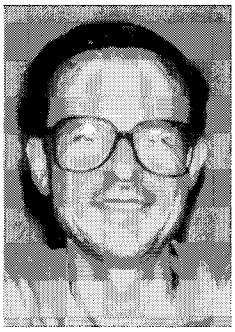
Michael E. Morris, M.D.
Education: University of California-Irvine, 1981; UW Orthopædics, 1986
Practice: Knee and shoulder reconstruction; appointment at Virginia Mason
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Leslie
Interests: Windsurfing, golf
Office: Mason Clinic Sports Medicine, 904 Seventh Ave., Seattle, WA 98104 (206/223-6487)
Home: 2326–11th Ave. E., Seattle, WA 98102 (206/324-9348)



Marr Mullen, M.D.
Education: M.D., University of Washington, 1955; UW Orthopædics, 1962
Practice: Adult joint reconstruction, spinal surgery; chief of orthopædics at Swedish, appointment at Providence
Affiliations: Clinical associate professor, University of Washington
Family: Spouse: Nancy; children: Kathi, Richard
Interests: Skiing, windsurfing, squash, mountain bike riding, hunting and fishing, flying
Future: Maintain active surgical practice till 65; increase time off; work on several clinical projects
Office: Orthopedics International, Ltd., 1600 East Jefferson St., Suite 400, Seattle, WA 98122 (206/323-1900)
Home: 5233 82nd Ave., SE, Mercer Island, WA 98040 (206/232-5134)

David R. Nank, M.D.
Education: M.D., Columbia College of Physicians and Surgeons, 1964; UW Orthopædics, 1972
Practice: General orthopædics; appointment at Stevens Memorial
Family: Children: Timothy, Elizabeth
Interests: Scuba diving, underwater photography, marine biology, diving medicine

Future: Return to school for a degree in marine biology/oceanography; work in diving medicine/research
Office: 21616–76th Ave. W., Suite 102, Edmonds, WA 98020 (206/774-5163)
Home: 1020 Fifth Ave. S., Edmonds, WA 98020 (206/776-4757)



John Alonzo Neufeld, M.D.
Education: M.D., Loma Linda University, 1965; UW Orthopædics, 1972
Practice: Foot and ankle
Affiliations: Senior clinical instructor, University of Oregon Health Sciences
Family: Spouse: Cheryl; children: Michael, John
Interests: Computers, electronics, running, Army reserves
Office: 10101 SE Main, Suite 1001, Portland, OR 97216 (503/257-0711)
Home: 20840 South Charriere Rd., Oregon City, OR 97045 (503/631-3226)

Douglas G. Norquist, M.D.
Education: M.D., University of Southern California, 1975; UW Orthopædics, 1980
Practice: Joint replacement, sports medicine, trauma; appointments at Valley Hospital and Medical Center, Sacred Heart, St. Lukes Memorial
Family: Spouse: Candace; children: Bridge, Barbara
Interests: Golf, windsurfing, skiing
Future: Remain in Spokane; continue to manage practice to allow increased time with family and for travel
Office: 210 Medical Center Bldg., South 820 McClellan, Spokane, WA 99204 (509/928-4334)
Home: North 6127 Campbell Rd., Otis Orchards, WA 99027 (509/926-3651)

Thomas F. O'Toole, M.D.
Education: M.D., St. Louis University, 1954; UW Orthopædics, 1962
Office: 1111–11th St., Rapid City, SD 57701

Mark C. Olson, M.D.
Education: M.D., University of Washington, 1969; UW Orthopædics, 1977
Office: East 12 Fifth St., Spokane, WA 99202 (509/838-7070)
Home: 1129 South Wall, Spokane, WA 99204 (509/455-9955)

William Oppenheim, M.D.
Education: M.D., Georgetown University, 1970; UW Orthopædics, 1978
Practice: Associate professor and head of pediatric orthopædics at UCLA; appointments at UCLA Medical Center, Cedars Sinai, Shriners Hospital of Los Angeles
Family: Children: Patty (an attorney)
Interests: Flying, tennis, computers
Future: The future is now.
Office: Dept. of Orthopædics, UCLA Medical Center, Los Angeles, CA 90024 (213/206-6345)
Home: 124 Outrigger Mall, Marina Del Ray, CA 90291 (213/827-0381)

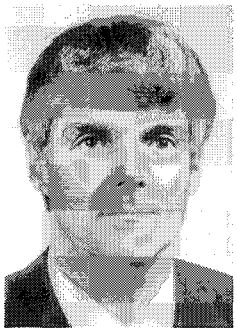
Elizabeth Anne Ouellette, M.D.
Education: M.D., University of Texas/San Antonio, 1978; UW Orthopædics, 1983
Practice: Assistant professor, Department of Orthopædics and Rehabilitation, University of Miami; interests in hand trauma, microvascular surgery, role of soft tissues in fracture management, psychology and surgical patient management; appointments at Doctor's Hospital, Cedars Medical Center
Family: Spouse: Brady Allen Elliott; children: Iain, Winston
Interests: Violin, swimming, my children
Future: Continue on the hand service at the University of Miami
Office: University of Miami, Dept. of Orthopædics, P.O. Box 016960 (D-27), Miami, FL 33101 (305/549-6371)
Home: 7445 S.W. 127th Ave., Miami, FL 33156 (305/238-5701)

Lawrence V. Page, D.O.
Education: D.O., Chicago College of Osteopathic Medicine, 1983; UW Orthopædics, 1989
Family: Spouse: Jenifer
Office: Scott Air Force Medical Center, Scott Air Force Base, IL 62225 (618/256-6350)
Home: 432 Timberline Ct., Shiloh, IL 62229

Jeffrey C. Parker, M.D.
Education: M.D., University of Southern California, 1979; UW Orthopædics, 1984
Practice: Rural orthopædics; appointments at Lookout Memorial, Belle Fourche Health Care Center, Northern Hills General Hospital, Sturgis Community, Ft. Meade VAMC, Hot Springs VAMC
Family: Spouse: Michal Suzanne; children: Marisa, John, McKenzie
Interests: Airplane construction and flying, white water kayaking
Future: Fun with the kids
Office: 144 West Jackson Blvd., Spearfish, SD 57783 (605/642-2737)
Home: Box A, Rally Rd., Spearfish, SD 57783 (605/642-4849)

Larry R. Pedegana, M.D.
Education: M.D., University of Alberta, 1968; UW Orthopædics, 1975
Practice: Upper extremity injuries, arthroscopic surgery, reconstructive surgery; appointments at Swedish, Providence, Overlake, Cabrini
Affiliations: Clinical assistant professor, University of Washington
Family: Spouse: Patricia; children: Robert, Stacy
Interests: Bicycling, backpacking
Office: First Hill Medical Bldg., 515 Minor Ave., Suite 110, Seattle, WA 98104 (206/623-2399)
Home: 606 Post Ave., #303, Seattle, WA 98104 (206/622-6671)

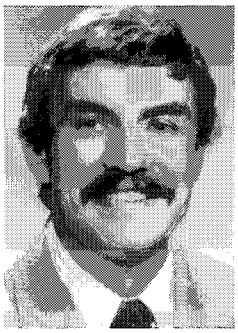
Arnold G. Peterson, M.D.
Education: M.D., University of Washington, 1970; UW Orthopædics, 1978
Practice: General orthopædics; appointments at Sacred Heart, Deaconess, St. Luke's Hospital
Family: Spouse: Sarah; children: Eric, Christine
Interests: Skiing, bicycling, windsurfing
Office: East 12 Fifth Ave., Suite 202, Spokane, WA 99202 (509/838-7100)
Home: East 1006 Overbluff, Spokane, WA 99203 (509/535-5593)



Michael Phillips, M.D.
Education: M.D., University of Washington, 1964; UW Orthopædics, 1970
Practice: General orthopædics, spine; appointments at Magic Valley Regional Medical Center, Twin Falls Clinic and Hospital, Cassia Memorial Hospital
Family: Spouse: Elaine; children: Thomas, Timothy, Michele
Interests: Skiing, golf, flying
Future: Retire in my home in Sun Valley as soon as possible
Office: 562 Shoup Ave. W., Twin Falls, ID 83301 (208/734-3455)
Home: 156 Los Lagos, Twin Falls, ID 83301 (208/734-3456)

Donald L. Plowman, M.D.
Education: M.D., University of Texas, 1967; UW Orthopædics, 1975
Practice: Arthoplasty, arthroscopy, trauma; appointments at Citizen Medical Center, Denton Hospital, Victoria Regional Medical Center
Interests: Gardening, golf, tennis, sailing; no time to do any well
Future: Get out of debt, no lawsuits, and retire
Office: 307 Leisure Lane, Victoria, TX 77901 (512/576-5015)
Home: 4208 Retama Circle, Victoria, TX 77901

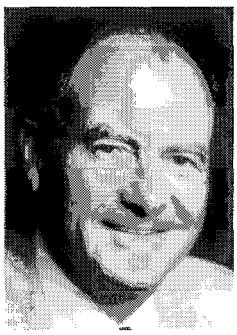
Arthur R. Ratcliffe, M.D.
Education: M.D., University of Washington, 1957; UW Orthopædics, 1962
Office: 13100 Military Rd. S., Suite 1, Seattle, WA 98146 (206/244-9986)
Home: 20423–10th Pl. SW, Seattle, WA 98168 (206/878-4790)



Steven S. Ratcliffe, M.D.
Education: M.D., Indiana University, 1977; UW Orthopædics, 1982
Practice: Trauma, hip and knee reconstruction; appointments at Overlake, Snoqualmie Valley Hospital
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Marijo Miller; children: Colin, Carleen
Interests: Woodworking, kids, ærobatic flying
Office: 600 NW Gilman Blvd., Suite E, Issaquah, WA 98027 (206/392-3030)
Home: 22710 SE 23rd Pl., Issaquah, WA 98027 (206/392-8202)

Steven L. Reed, M.D.
Education: M.D., University of Washington, 1982; UW Orthopædics, 1987; fellowships at Institut Francais de la Main, Paris (7/87–1/88), and University of Lund, Sweden (1/88–6/88)
Practice: Appointments at Evergreen, Overlake, Children's Hospital
Family: Spouse: Janice; children: Monica, Michael
Office: 13131–120th Ave. NE, #D, Kirkland, WA 98034 (206/823-4224)
Home: 6208–41st Ave. NE, Seattle, WA 98115 (206/527-2478)

William Anthony Reilly, Jr., M.D.
Education: M.D., University of California-San Francisco, 1957; UW Orthopædics, 1966
Office: 181 Andreiux St., Suite 103, Sonoma, CA 95476 (415/387-3306)
Home: 375 Perkins St., Sonoma, CA 95476



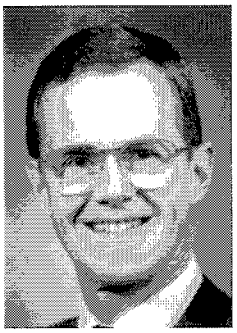
Robert L. Romano, M.D.
Education: M.D., St. Louis University, 1948; UW Orthopædics, 1955
Practice: Appointments at Swedish, Providence
Family: Spouse: Mary Jean; children: Robert Jr., Anne, Maureen, Stephen, John, James
Interests: Photography, gardening (including hydroponics), skiing, tennis
Future: Retire or cut back practice markedly in one year
Office: Orthopedics International, Ltd., 1600 East Jefferson St., Stuie 400, Seattle, WA 98122 (206/323-1900)
Home: 1645–73rd NE, Bellevue, WA 98004 (206/455-0488)

Louis Alan Roser, M.D.
Education: M.D., University of Utah, 1965; UW Orthopædics, 1971
Practice: General orthopædics, missionary medicine; appointments at St. Peter and Black Hills in Olympia, Mason County General in Shelton; medical director, Objective Medical Assessments Corp. in Seattle
Family: Spouse: Vicki; children: Chip, Cindi, Kathi
Interests: Fly fishing, skiing, sailing
Future: Continue practicing until age 60 at a slightly slower pace; do more missionary medicine in Spanish speaking countries.

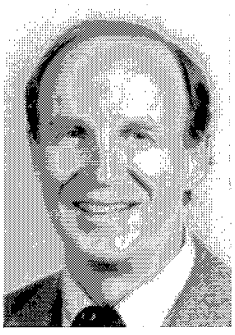
Ronald B.H. Sandler, M.D.
Education: M.D., University of Iowa, 1966; UW Orthopædics, 1974
Practice: Sports medicine, joint reconstruction; appointments at Mesa Lutheran, Valley Lutheran, Desert Samaritan
Family: Spouse: Rita
Interests: Flying, golf
Future: Increase practice time in Third World countries
Office: 500–West 10th Pl., Mesa, AZ 85201 (602/964-2908)
Home: 2033 North Gentry, Mesa, AZ 85203

Stewart M. Scham, M.D.
Education: M.D., Columbia College of Physicians and Surgeons, 1960; UW Orthopædics, 1968
Office: 21616–76th Ave. W., Suite 102, Edmonds, WA 98020 (206/774-5163)
Home: 23520 Woodway Park Rd., Edmonds, WA 98020 (206/546-6107)

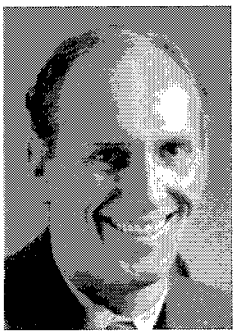
Kevin P. Schoenfelder, M.D.
Education: M.D., University of Minnesota, 1979; UW Orthopædics, 1984
Office: 1515 South K St., Tacoma, WA 98405 (206/572-2663)
Home: 122 Point Fosdick Circle, Gig Harbor, WA 98335 (206/851-3078)



Robert D. Schrock, Jr., M.D.
Education: M.D., Cornell University, 1964; UW Orthopædics, 1970
Practice: Cerebral palsy, arthritis; appointments at The Genesse Hospital, Strong Memorial
Affiliations: Clinical assistant professor, University of Rochester
Interests: Sailing, music
Future: Develop an efficient orthopædic practice
Office: 220 Alexander St., Rochester, NY 14607 (716/546-2780)
Home: 8 Stonegate Lane, Pittsford, NY 14534 (716/385-2276)



Richard L. Semon, M.D.
Education: M.D., University of Washington, 1974; UW Orthopædics, 1979
Practice: General orthopædics, sports medicine; appointments at General Hospital and Providence; chairman, Dept. of Orthopædics (1988-89)
Family: Spouse: Andrea; children: Eric
Interests: Reading, running, woodworking, model trains, skiing
Future: Continued hard work
Office: Pacific Avenue Medical Bldg., 1100 Pacific Ave., Suite 300, Everett, WA 98201 (206/339-2433)
Home: 711 Grand Ave., Everett, WA 98201 (206/259-9973)



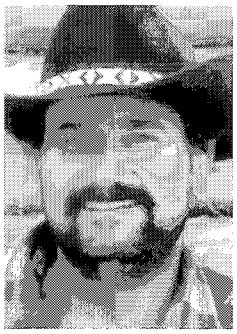
Geoffrey W. Sheridan, M.D.
Education: M.D., Cornell University, 1972; UW Orthopædics, 1977
Practice: Sports medicine; appointment at Overlake
Family: Spouse: Margo; children: Ian, Katie, Geoffrey
Interests: Reading, skiing
Office: 1632–116th Ave. NE, Suite C, Bellevue, WA 98004 (206/462-9800)
Home: Same (206/323-0670)

Robert Frederick Smith, M.D.
Education: M.D., University of Washington, 1960; UW Orthopædics, 1967
Practice: Fractures, total joints, spine surgery; appointments at Skagit Valley Hospital
(Mt. Vernon), Island Hospital (Anacortes), United General (Sedro Wolley), Whidbey General (Coupeville)
Family: Spouse: Madeleine; children: Lance (deceased 10/88 at age 28), Stacia (2nd-year orthopædic resident at UC-San Diego), Frederick
Interests: Hunting, fishing
Future: Continued orthopædic practice
Office: 1311 East Division St., Mount Vernon, WA 98273 (206/424-7041)
Home: 618 West Lake Samish Dr., Bellingham, WA 98226 (206/733-1444)

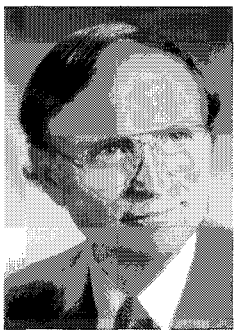
William Vaughn Smith, M.D.
Education: M.D., Baylor University, 1954; UW Orthopædics, 1959
Practice: General orthopædics; appointments at Central Washington Hospital (chief of orthopædics)
Family: Spouse: Carolyn; children: Ann, Paul, Nancy
Interests: Golf, hiking, travel
Future: Travel
Office: 820 North Chelan St., Wenatchee, WA 98801 (509/663-8711)

Home: 941 Idaho St., Wenatchee, WA 98801 (509/663-6722)

Thomas E. Soderberg, M.D.
Education: M.D. University of Utah, 1958; UW Orthopædics, 1964
Office: Bryner Clinic, 745 East Third South, Salt Lake City, UT 84102 (801/328-7195)
Home: (801/583-4708)



Michael A. Sousa, M.D.
Education: M.D., University of Hawaii, 1975; UW Orthopædics, 1980
Practice: Arthroscopy, joint arthroplasties; appointments at St. Patricks Hospital, Missoula County Hospital
Family: Spouse: Jan
Interests: Ranching, horseback riding, western outdoors
Future: Working less, playing more; plan to do voluntary medicine in the Third World, St. Kitts Island, April 1990
Office: Garden City Medical Center, 601 West Spruce, Missoula, MT 59802 (406/728-1498)
Home: 1915 36th St., Missoula, MT 59801 (406/721-3813)

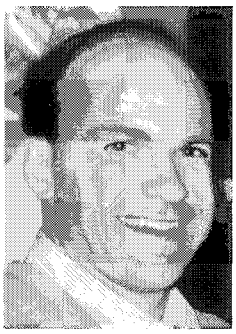


Lynn T. Staheli, M.D.
Education: M.D., University of Utah, 1959; UW Orthopædics, 1968
Practice: Director, Dept. of Orthopædics, Children's Hospital and Medical Center, Seattle; professor, University of Washington; pediatric orthopædics
Family: Spouse: Lana; children: Linda, Diana, Todd
Interests: Sailing, flying
Office: Dept. of Orthopedics, ZC-10, Children's Hospital and Medical Center, 4800 Sand Point Way NE, Seattle, WA 98105 (206/526-2108)
Home: 2301 Fairview Ave. E., #404, Seattle, WA 98102 (206/322-7155)

Robert J. Strukel, M.D.
Education: M.D., University of Minnesota, 1973; UW Orthopædics, 1978
Office: Medical Director, Rogue Valley Medical Center, 2825 Barnett, Medford, OR 97504 (503/770-4200)

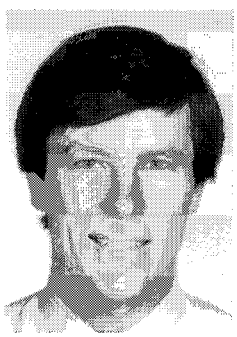
Marc F. Swiontkowski, M.D.
Education: M.D., University of Southern California, 1979; UW Orthopædics, 1984
Practice: Chief of orthopædic traumatology, Harborview Medical Center; associate professor and vice chairman, Department of Orthopædics, University of Washington; interests in trauma, trauma reconstruction, osteomyelitis; appointments at Harborview, UW Medical Center, Children's Hospital
Family: Spouse: Beth; children: Timothy, Jeffery, Ellen
Interests: Bicycle racing, carpentry
Office: Dept. of Orthopædics, Harborview Medical Center, ZA-48, 325 Ninth Ave., Seattle, WA 98104 (206/223-5414)
Home: 6379 NE 151st St., Bothell, WA 98011 (206/488-2968)

Carol Claire Teitz, M.D.
Education: M.D., Yale University, 1974; UW Orthopædics, 1980
Practice: Associate professor, UW Department of Orthopædics; interests in sports medicine, performing arts medicine (dancers and musicians), arthroscopy; appointments at UW Medical Center, Children's Hospital, Harborview, VA Medical Center
Family: Spouse: Robert Sanford; children: Jonathan, David
Office: UW Division of Sports Medicine, GB-15, Seattle, WA 98195 (206/543-1550)
Home: 3 Brook Bay, Mercer Island, WA 98040 (206/232-7885)

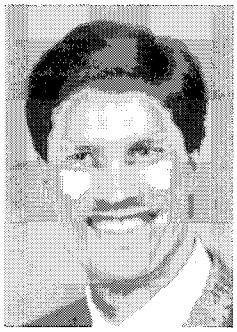


John L. Thayer, M.D.
Education: M.D., University of Washington, 1977; UW Orthopædics, 1982; fellowship at Long Beach Memorial Hospital Medical Center, 1982
Practice: Sports medicine and knee surgery; appointments at Overlake, Snoqualmie Valley Hospital
Affiliations: Clinical instructor, University of Washington
Family: Spouse: Kathleen (Kit); children: Carolyn, Lew
Interests: Running, tennis, kids, nuclear physics
Office: 600 NW Gilman Blvd., Suite E, Issaquah, WA 98027 (206/392-3030); 1632–116th Ave. NE, Bellevue, WA 98004 (206/462-9800)
Home: 2651 Evergreen Pt. Rd., Bellevue, WA 98004 (206/454-9910)

William T. Thieme, M.D.
Education: M.D., Washington University/ St. Louis, 1961; UW Orthopædics, 1968
Practice: Interests in pediatric hip disease, AIDS epidemic; appointments at Ballard, Swedish, Virginia Mason, Children's Hospital, Providence, Northwest, Cabrini
Affiliations: Clinical associate professor, University of Washington
Interests: Croquet, golf, skiing, sailing, gardening, tennis
Future: Continue practice, publish, write, travel, eventually retire
Office: 1221 Madison St., Suite 1012, Seattle, WA 98104 (206/622-6522)
Home: 3907–47th NE, Seattle, WA 98105 (206/525-4398)

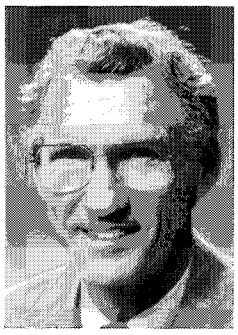


Steven C. Thomas, M.D.
Education: M.D., Johns Hopkins University, 1983; UW Orthopædics, 1989; fellowship on the University of Washington shoulder and elbow service, 1989
Practice: Shoulder, knee
Family: Spouse: Karen; children: Sierra, Corin
Interests: Skiing, diving, biking, saxaphone, sailing, soaring
Future: Circumnavigation
Office: Orthopædic Specialists, 701 South Tonopah Dr., Las Vegas, NV 89106 (702/388-1008)
Home: 7632 West Botany Bay Dr., Las Vegas, NV 89128 (702/363-9916)



Michael A. Thorpe, M.D.
Education: M.D., University of Iowa, 1983; UW Orthopædics, 1988
Practice: Adult reconstruction, shoulder, arthroscopic knee and shoulder surgery, trauma, foot general orthopædics; appointment at St. Joseph Hospital
Family: Spouse: Sonja; children: Annalisa, Brittany, Kjerstin, expecting #4 in May 1990
Interests: Basketball, water skiing, downhill skiing, hiking, camping, fishing
Future: Stay in Bellingham ... we love it here. No more kids!
Office: Northwest Medical Center, 3149 Ellis, Bellingham, WA 98225 (206/676-9259)
Home: 573 Pleasant Bay Rd., Bellingham, WA 98226 (206/671-6026)

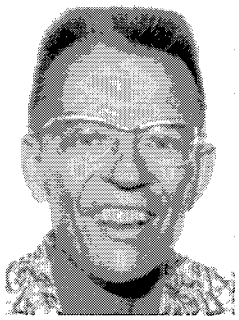
Irving Tobin, M.D.
Education: M.D., University of Oregon, 1955; UW Orthopædics, 1960
Affiliations: Clinical associate professor, University of Washington
Office: 1300 Cabrini Tower, 901 Boren, Seattle, WA 98104 (206/623-0746)
Home: 3665 West Mercer Way, Mercer Island, WA 98040 (206/232-3553)



Hugh E. Toomey, M.D.
Education: M.D., UCLA, 1963; UW Orthopædics, 1969
Practice: Hip and knee reconstruction
Affiliations: Clinical professor, University of Washington
Family: Spouse: Mary (Tish); children, Beth, Patty, Steve, Sean
Office: Orthopædic Physicians, Inc., 1229

Madison Ave., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 3137 West Laurelhurst Dr. NE, Seattle, WA 98105 (206/527-5547)

Martin Shelton Tullus, M.D.
Education: M.D., University of Washington, 1976; UW Orthopædics, 1981
Practice: General orthopædics; appointment at Valley Medical Center
Family: Spouse: Diane; children: Kristina
Interests: Sports
Office: Valley Orthopædic Associates, 4011 Talbot Rd. S., Suite 300, Renton, WA 98055 (206/226-6900)
Home: 19 Tulalip Key, Bellevue, WA 98006 (206/644-1524)



James W. Tupper, M.D.
Education: M.D., University of Pennsylvania, 1953; UW Orthopædics, 1959
Practice: Retired; interests in spinal deformities; appointments at Swedish, Children's Hospital, Cabrini, Providence, UW Medical Center
Affiliations: Clinical professor emeritus, University of Washington
Interests: Skiing, woodworking, carpentry, gardening, trying to stay in good physical condition
Future: All of the above plus making furniture and wood turning for others
Home: 3126 West Laurenhurst Dr. NE, Seattle, WA 98105 (206/523-7280)

Robert G. Veith, M.D.
Education: M.D., University of Washington, 1975; UW Orthopædics, 1981
Affiliations: Clinical assistant professor, University of Washington
Office: Valley Orthopædic Associates, 4011 Talbot Rd. S., Suite 300, Renton, WA 98055 (206/226-6900)
Home: 28 Chelan Key, Bellevue, WA 98006 (206/747-5291)

Theodore A. Wagner, M.D.
Education: M.D., Temple University, 1968; UW Orthopædics, 1973
Practice: General orthopædics with special interest in spine surgery; appointments at Swedish, Cabrini, Providence, Children's Hospital, UW Medical Center, Harborview
Affiliations: Clinical associate professor, University of Washington
Family: Spouse: Iris; children: Thor, Lara
Interests: "Anything in the outback," photography
Future: Take my orthopædics internationally
Office: Orthopædic Physicians, Inc., 1229 Madison Ave., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 216–40th Ave. E., Seattle, WA 98112 (206/322-7565)

Robert P. Watkins, M.D.
Education: M.D., Baylor College of Medicine, 1967; UW Orthopædics, 1973
Practice: Trauma, shoulder; appointment at Olympic Memorial
Family: Spouse: Lynn Dee; children: Hilary, Stephen, Joanna, Catherine
Interests: Masters swimming, rebuilding son's and friends' dirt bikes and autos, welding unusual metals
Office: 1004 Caroline St., Port Angeles, WA 98362 (206/457-0491)
Home: 863 Mount Angeles Rd., Port Angeles, WA 98362 (206/452-7520)

Richard S. Westbrook, M.D.
Education: M.D., University of Texas/ Galveston, 1973; UW Orthopædics, 1978
Practice: Sports medicine, foot, knee, spine
Family: Spouse: Jan; children: Richard, Sallie
Interests: Skiing, fly fishing, motorcycle riding, weight lifting
Office: 2150 Trawood, Suite A150, El Paso, TX 79935 (915/595-1099)
Home: 1117 Kerbey, El Paso, TX 79902 (915/532-6668)

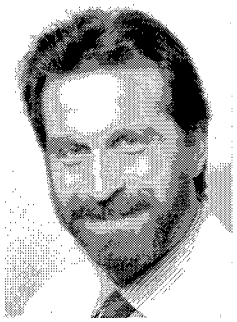
Richard Williamson, M.D.
Education: M.D., University of California-San Diego, 1983; UW Orthopædics, 1988
Office: Northwest Orthopædic Surgery, 1311 East Division St., Mount Vernon, WA 98273 (206/424-7041)
Home: 1403–7th Ave., Anacortes, WA 98221 (206/293-3499)

Robert A. Winquist, M.D.
Education: M.D., University of Washington, 1969; UW Orthopædics, 1975
Practice: Interests in knee, hip, and ankles, and research on lower extremity injuries; appointments at Swedish, Children's Hospital
Affiliations: Clinical professor, University of Washington
Family: Spouse: Judith; children: James, Katherine
Interests: Skiing, hiking, windsurfing, art history
Office: Orthopædic Physicians, Inc., 1229 Madison Ave., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 2311 Fifth Ave. N., Seattle, WA 98109 (206/282-2018)

Henry K. Yee, M.D.
Education: M.D., University of Washington, 1978; UW Orthopædics, 1983
Practice: General orthopædics; appointment at Kaiser Hospital
Interests: Beach activities
Office: 3288 Moanalua Rd., Honolulu, HI 96819 (808/834-5333)

Jerome H. Zechman, M.D.
Education: M.D., Creighton University, 1963; UW Orthopædics, 1971
Practice: General orthopædics
Family: Spouse: Mary Ann; children: Jerome (2nd year orthopædic resident), Nicholas, Vaughn, Mary Cecelia; one granddaughter
Interests: Boating, fishing, traveling
Future: More free time for boating, fishing, traveling, and all the other fun things in life
Office: 3525 Ensign Rd., Suite E, Olympia, WA 98506 (206/491-4211)
Home: 6120–88th Ave. NE, Olympia, WA 98506 (206/491-8081)

Richard A. Zorn, M.D.
Education: M.D., University of Washington, 1972; UW Orthopædics, 1976
Affiliations: Clinical associate professor, University of Washington
Office: Orthopædic Physicians, Inc., 1229 Madison Ave., Suite 1600, Seattle, WA 98104 (206/386-2600)
Home: 7 Brook Bay, Mercer Island, WA 98040 (206/232-2595)



Joseph Zuckerman, M.D.
Education: M.D., Medical College of Wisconsin, 1978; UW Orthopædics, 1983; fellowship in adult reconstruction at Brigham and Women's Hospital, Boston, 1984
Practice: Shoulder and adult reconstructive surgery, interest in geriatric hip fractures; chief of shoulder service and director of geriatric hip fracture program at Hospital for Joint Diseases Orthopædic Institute
Affiliations: Assistant professor, New York University
Family: Spouse: Janet; children: Scott, Matthew
Future: Continue my position in full-time academic orthopædic surgery
Office: 301 East 17th St., New York, NY 10003 (212/598-6674)
Home: 7 Marbourne Dr., Mamaroneck, NY 10543 (914/698-8995)

University of Washington Department of Orthopædics

Year	Graduating Residents	Chair	Dean	LeCocq Lecturers
1950	Einar Henriksen		Edward Turner (Sept. 1945—9/30/53)	
1951		Robert D. Ray (Division Head, 1951—1956)		
1952	Park W. Gloyd			
1953				
1954	Trygve Forland		James Haviland (Acting Dean, 10/1/53–8/1/54)	
1955	Robert W. Florence		George Aagaard (8/1/54–6/30/64)	
1956	J. Michael Egglin John E. Goeckler	John F. LeCocq (Acting Division Head, 9/1/56–9/14/58)		
1957	John H. Aberle John R. Beebe			
1958	Samuel L. Clifford James R. Friend Harry H. Kretzler, Jr. Kenneth L. Martin			
1959	James W. Tupper	D. Kay Clawson (Division Head, 9/15/58—7/1/65)		
1960	William V. Smith Irving Tobin			
1961	Robert C. Colburn			
1962	Marr Mullen Thomas F. O'Toole			
1963	Alfred I. Blue Robert A. Kraft Robert R. Mensendiek			
1964	Harold J. Forney Theodore K. Greenlee, Jr. David E. Karges Thomas E. Soderberg		John Hogness (7/1/64—8/31/69)	
1965		D. Kay Clawson (Chair, 7/1/65—3/31/75)		William T. Green Harvard Medical School
1966	F. Richard Convery Joseph S. Mezistrano William A. Reilly, Jr.			Donald E. King Stanford University
1967	Ivar W. Birkeland, Jr. Joseph C. Clifford Robert F. Smith			Robert A. Robinson Johns Hopkins University
1968	Steward M. Scham Lynn T. Staheli William T. Thieme			Fred C. Reynolds Washington University
1969	Edward E. Almquist, Jr. Sigvard T. Hansen, Jr. Edward L. Lester Hugh E. Toomey			Robert B. Salter University of Toronto

Year	Graduating Residents	Chair	Dean	LeCocq Lecturers
1970	John Carlisle Brown John M. Coletti, Jr. Malcolm B. Madenwald Michael Phillips Robert D. Schrock, Jr.		Robert Van Citters (2/16/70—6/30/81)	Verne T. Inman University of California, San Francisco
1971	Franklin G. Alvine Bruce E. Bradley, Jr. Nils Fauchald, Jr. Louis A. Roser Jerome H. Zechmann			J.I.P. James University of Edinburgh
1972	Andrew B. Dott III Thomas L. Gritzka Donald D. Hubbard David J. LaGasse David R. Nank John A. Neufeld			Charles Frances Gregory University of Texas, Dallas
1973	Frederick J. Davis Larry D. Hull Theodore A. Wagner Robert P. Watkins			Robert D. Ray Abraham Lincoln School of Medicine
1974	Samuel R. Baker Robert C. Begg Richard A. Dimond Ronald B.H. Sandler			Mark B. Coventry Mayo Medical School
1975	William M. Backlund Thomas M. Green Gunter Knittel Frederick A. Matsen III Larry R. Pedegana Donald L. Plowman Robert A. Winquist	Sigvard T. Hansen, Jr. (Acting Chair, 4/1/75—12/31/75)		Henry M. Mankin Harvard Medical School
1976	John F. Burns Douglas T. Davidson Douglas T. Kehl Peter Melcher Richard A. Zorn			Charles S. Neer, II Columbia University
1977	Carl A. Andrews Steven T. Bramwell Larry D. Iversen Mark C. Olson Geoffrey W. Sheridan	Victor H. Frankel (Chair, 1/1/76—1/1/81)		Jack C. Hughston Tulane University
1978	John W. Brantigan Gary J. Clancey William Oppenheim Arnold G. Peterson Robert J. Strukel Richard S. Westbrook			Ian Mcnab University of Toronto
1979	Allan W. Bach Gregory M. Engel Jonathan L. Knight Richard L. Semon			J. Leonard Goldner Duke University

Year	Graduating Residents	Chair	Dean	LeCocq Lecturers
1980	John M. Hendrickson Stuart R. Hutchinson Douglas Norquist Michael A. Sousa Carol C. Teitz			Augusto Sarmiento University of Southern California
1981	John M. Clark, Jr. Dennis J. Kvidera Martin S. Tullus Robert G. Veith	Sigvard T. Hansen, Jr. (Chair, 1/1/81—6/30/85)	John Chase (Acting Dean, 7/1/81—2/18/82)	Clement B. Sledge Harvard University
1982	William D. Burman Richard M. Kirby Steven S. Ratcliffe John L. Thayer		John Chase (2/19/82—6/30/82) Theodore Phillips (Acting Dean, 5/17/82—10/1/82)	Albert B. Ferguson, Jr. University of Pittsburgh
1983	Robert M. Berry Edward L. Farrar III Keith A. Mayo Elizabeth A. Ouellette Henry K. Yee Joseph Zuckerman		David A. Dale (10/4/82—7/3/86)	Sherman S. Coleman University of Utah
1984	Jeffrey W. Akeson Thomas J. Fischer Jeffrey C. Parker Kevin P. Schoenfelder Marc F. Swiontkowski			David G. Murray Upstate Medical Center (New York)
1985	Paul J. Abbott William P. Barrett Richard J. Barry Daniel L. Flugstad Jeffrey N. Hansen	Benjamin K. Belknap (Acting Chair, 7/1/85—12/31/85)		David S. Bradford University of Minnesota
1986	Gary Bergman Lawrence E. Holland Carleton Keck Michael E. Morris	Frederick A. Matsen III (Chair, 1/1/86—present)	Theodore Phillips (Acting Dean, 7/4/86—12/31/87)	Martin Allgöwer University of Basel
1987	Craig Arntz Herbert R. Clark Michael K. Gannon Steven L. Reed			Charles A. Rockwood, Jr. University of Texas, San Antonio
1988	Jonathan L. Franklin Michael A. Thorpe Richard Williamson		Michael A. Whitcomb (1/1/88—3/14/90)	Mercer Charles Rang University of Toronto
1989	James P. Crutcher Nancy J. Ensley Martin G. Mankey Lawrence V. Page Steve C. Thomas			Russell F. Warren Cornell Medical College
1990	J. Roberto Carreon Kenneth Fujii David M. Kieras Walter Krengel Jay A. Winzenried		Bruce C. Gilliland (Acting Dean, 3/14/90–present)	Robert B. Winter University of Minnesota Gillette Children's Hospital

Acknowledgements and Epilogue

Attempting to write a history is a dangerous activity in that the whole story can never be told. Because of publication constraints, numerous details must be omitted and the perspective of many important players cannot be appropriately reflected. Nevertheless, we hope this brief history of the Department of Orthopædics has deepened understanding of where we have been, where we are, and where we are headed.

The story presented on these pages was derived in large part from notes prepared by D. Kay Clawson, both during his tenure with the Department and in subsequent years. Certainly no one has done a better job of keeping notes, letters, and other pertinent material. We were helped by Robert Ray, Ed Almquist, Ted Hansen, Bob Smith, Ted Wagner, Ivory Larry, Julia Goggin, and Bea Watts in rounding out the perspective. Marc Swiontkowski has done an outstanding job of coordinating the project. We owe special thanks to the numerous staff members who assisted in the production of this book, in particular to our editor, Sandy Marvinney, who brought all these ideas together in such a wonderful way, to photographer Ed Kohnstamm for his expert portrayal of our Orthopædic people, places, and programs, to Diana Jansen for her administrative guidance, and to my office staff, Sarah Sato, Rita Mandoli, and Sue Bristol for their hard work at the keyboard.

The Department or Orthopædics has come far and accomplished much since its early days. While this history has been written largely in terms of a truly outstanding group of faculty leaders and residents, much of the credit for this progress should go to individuals who are less frequently recognized but highly deserving of our appreciation — past and present departmental managers such as Julia Goggin, Sandy Greenlee, Karen Morton, and Diana Jansen; secretaries such as Bea Watts, Sarah Sato, and Merrill Anderson; physicians' assistants such as Ivory Larry; clinic nurses such as Colleen Johnson and Marietta Weber, and all of our office helpers, research assistants, operating room nurses, and floor nurses, past and present. It would be impossible to run an effective department without quality individuals in each of these many key positions.

Special recognition also must go to the clinical faculty, that group of more than 100 individuals who provide a wealth of teaching expertise for students and residents, and who have been so generous in their support of the Department's clinical, teaching, and research missions. Without them our program could not have achieved so much.

We also are particularly grateful for the growing contributions of the residency program alumni. Our former residents have rallied with progressively increasing enthusiasm to support the Department. We are trying to reciprocate by improving communication with our graduates, and beginning this year, we will schedule regular class reunions. The importance of the alumni is symbolized in all the accomplishments recorded in this volume and in their contributions toward the establishment of the D. Kay Clawson Library.

Finally, we must pay particular tribute to D. Kay Clawson, whose tenure in the leadership role of this Department was greater than everyone else's, who set the standards to which we have tried to adhere, and who is responsible for Orthopædics becoming a department of the School of Medicine. From the moment that Orthopædics attained this status, the tools became available to achieve the excellence we enjoy today and the greater excellence we plan for the future.

Perhaps the most appropriate closing is one of the favorite quotes that Dr. Clawson often invoked in his presentations. It is called "Losers Vs. Winners."

The loser is always part of the problem,
... the winner is always part of the answer.
The loser always has an excuse,
... the winner always has a program.
The loser says "that's not my job."
... The winner says "I can help with that."
The loser has a problem with every suggestion,
... the winner has a suggestion for every problem.
The loser sees two or three sand traps near every green,
... the winner sees a green near every sand trap.
The loser says it may be possible but it's too difficult,
... the winner says it may be difficult, but it's possible.

Frederick A. Matsen III, M.D., Chairman