

OREF Clinician Scientist Seeking to Redefine Minimally Invasive

Achieving a spinal fusion or regenerating a diseased spinal disc by way of a simple injection may sound to some like science fiction, but **Francis H. Shen, M.D.** is working to make such surgery-free treatments possible, now with the help of a Clinician Scientist Award given by OREF.

Dr. Shen was named a 2007 recipient of the award, which provides an annual stipend of \$100,000 for three years to compensate for the loss of income associated with devoting more time to research, and less time to clinical practice.

In return, OREF Clinician Scientists are asked to devote extensive time to research, serve as role models for orthopaedic residents, interns, and medical students, and organize and participate in conferences.

Dr. Shen's award will be funded by the **Dr. Dane and Mrs. Mary Louise Miller Endowment Fund.**

"I'm just beginning to understand what a large honor it is to receive this award," said Dr. Shen. "And I'm beginning to understand the significance it has for me as a clinician scientist, for my career, for what our lab can do and for how much we can accomplish for our patients."

Dr. Shen, an assistant professor in the department of orthopaedic surgery at the University of Virginia School of Medicine, and recipient of a 2006 OREF-Zimmer Career Development Award, will use the Clinician Scientist Award to continue his search for new sources of bone tissue and, ultimately, less invasive treatments for spinal disorders.

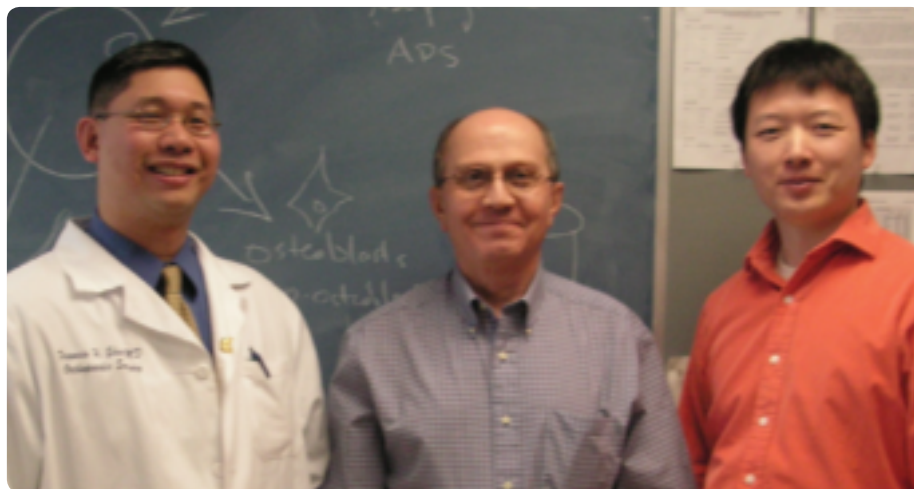
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Getting to Zero: How OREF-funded Research Fits in the Fight to Eliminate Intra-operative Infection

Preventing surgical infection is fundamental to total joint replacement procedures, so it's no wonder the topic has been the subject of numerous research studies. With an OREF Research Grant, **Harlan C. Amstutz, M.D.** was among those who sought to establish a correlation between operating room ventilation systems and reduction of intra-operative infections.

"Intra-operative infections, I would say, were the plague of the very earliest joint replacements done in this country," said Dr. Amstutz, professor emeritus and former chief of orthopaedic surgery at the University of California at Los Angeles (UCLA), who is best known for his work on total hip replacements and for founding the Joint Replacement Institute. "Unfortunately, the operative

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Dr. Shen is pictured with Gary Balian, Ph.D., the Mary Muilenburg Stamp professor of orthopaedic research at the University of Virginia School of Medicine. Dr. Balian is Dr. Shen's research mentor and a world-renowned specialist in stromal cell and cell tissue research. They are joined by Joshua Xudong Li, M.D., Ph.D. (Right), assistant professor of orthopaedic research and frequent collaborator.

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John J. Callaghan, M.D.
Board Chair

A Shared Commitment to Orthopaedic Unity

I made a decision early in my career to actively participate in the work of the orthopaedic organizations that do so much to advance my professional interests, as a surgeon and as an investigator. Having received so much in return, in my new capacity as OREF Board Chair I am devoting special attention to how OREF can deliver — concretely — on our shared commitment to orthopaedic unity.

As one example, at our annual Partners Luncheon in April, OREF staff introduced a new E-mail Services Program that offers our orthopaedic partners an easy way to invite fellow members to support their organizations through OREF, with the help of OREF's communications expertise and electronic tools.

Among the tools from which specialty orthopaedic partners can choose is Level 1, a simplified link to use in their printed materials and on their Web sites. Written as [www.oref.org/\(orthopaedic partner acronym\)](http://www.oref.org/(orthopaedic partner acronym)), the link leads to a secure, online donation form featuring that orthopaedic organization as the sole choice for designating a contribution. To qualify for designations, contributions must be made at the Order of Merit level —\$1,000 and above — with the first \$500 earmarked for OREF.

OREF can also help orthopaedic partners send a general e-mail to their mailing lists. This Level 2 strategy features Tell-a-Friend links, allowing e-mail recipients to add their personalized messages before forwarding the e-mail to colleagues. The e-mail message also includes the simplified link from the Level 1 service.

The third level of service with which OREF can help orthopaedic organizations is a personalized e-mail campaign sent to the organization's members. The Level 3 service includes all features from both Levels 1 and 2, plus the ability to track how many messages were opened, passed along to a colleague, and other results metrics.

In addition to these e-mail services, OREF recently

provided several orthopaedic partners with copies of our second printing of "Essential Guidelines, Regulations and Ethical Considerations: The Evolving Relationship between Orthopaedists and Industry." Written by **Marjorie Eskay-Auerbach, M.D., J.D.**, this article, which first appeared as a supplement to the February 2007 issue of the *Journal of the American Academy of Orthopaedic Surgeons*, provides practical ways to improve health care compliance.

OREF's Designated Giving Program continues to be an important aspect of our relationship with orthopaedic partners. Organizations can use the funds to support their research and education missions. For example, at the Orthopaedic Research Society (ORS)/OREF Grant Recipient Recognition Breakfast, **Joshua J. Jacobs, M.D.** discussed some of the ways ORS benefits as one of OREF's Designated Giving Partners. Contributions to ORS through OREF's Designated Giving Program have enabled ORS to fund New Investigator Recognition Awards (NIRA), a Career Development Fellowship, a Clinician Scientist Development Program, Educational Grants, and Grant Writing Workshops.

I am consulting other OREF Trustees and working with staff to find additional ways to strengthen the support we offer to the orthopaedic community. We have recently formed the OREF Sub-Specialty Society Relations Committee, headed by **Richard J. Haynes, M.D.** I invite orthopaedic partners to contact us at **communications@oref.org** at any time to tell us how they've used funding they've received through OREF's Designated Giving Program, or how OREF might be more attentive to their particular research and education concerns and, more broadly, be a better orthopaedic partner.

Sincerely,

John J. Callaghan, M.D.
Board Chair

The following orthopaedic partners have taken advantage of OREF's

E-mail Services Program:

AAHKS	POSNA	ORS
AOA	OLC	OTA
AOSSM	OO	SRS

To learn more about OREF's e-mail services, please contact:

Jon Reich
Manager, Website Services
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(847) 384-4353

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The Importance of OREF's Endowment and the Need for Annual Donations: A Two-Pronged Approach to Support Research

Thank you! With your support, OREF increased the cash value of our endowment from \$13.4 million in December 2002 to a total of \$22.1 million in December 2006, a 65% increase, in just five years.

As of May 31, 2007, the total cash value of the OREF endowment was \$23.6 million. This includes funds for OREF and for more than 30 endowment partners, orthopaedic groups for which we raise and invest donated funds. In addition, we have recorded pledges and deferred gift commitments estimated to be worth \$5.5 million and \$42 million respectively.

These impressive gains have come primarily through major gifts from our esteemed Shands Circle members, who continue to welcome more generous orthopaedic leaders to their ranks. The box on page 4 recognizes 20 more donors who have become part of this prestigious group since January 2007, bringing total Shands Circle membership to more than 490.

Endowment Support: Good News and Good Timing

This is good news as we try to ensure the future of orthopaedic research with permanent funding. At several recent orthopaedic society meetings, we've heard many lament that large-scale funding for orthopaedic research is becoming increasingly difficult, if not impossible, to obtain. This means that supporting research through OREF is more than the right thing to do; it is absolutely necessary.

The OREF endowment may best be thought of as a community endowment: a portfolio of individual funds that support research and education initiatives for more than 30 orthopaedic organizations. Gifts made to endowment funds are invested permanently; only earnings on principal will be used each

year to support research and educational programs.

These endowment funds support the goals of regional, national, and international orthopaedic societies and professional organizations. The leadership of each organization determines how the income generated by their fund(s) should be used.

In addition, our portfolio includes a fund dedicated to supporting the research that OREF itself sponsors. The OREF Board of Trustees directs the income from that fund to support OREF's mission, and funds donated directly to OREF have launched the careers of many successful researchers.

For a complete list of funds that comprise the OREF endowment, please visit www.oref.org/endowments.

OREF's Endowment Services

Why do so many orthopaedic organizations choose to have their endowment funds managed as dedicated funds under the OREF endowment umbrella? Because OREF can provide a broad range of services, including: developing and implementing an endowment campaign strategy; recognizing donors with tax receipts; investing the funds; and timely reporting of gifts as well as fund performance. While OREF offers these services, the organization maintains control of the income. The OREF endowment — under the direction of the OREF Finance Committee — has historically performed well, usually beating relevant indices and keeping expenses low, while avoiding significant losses in bad years.

Annual Giving

To fund current projects, we need to continue our annual giving campaigns even while we work to build for the future. Annual gifts can



Gene R. Wurth
President and CEO

be spent in their entirety each year. As mentioned in Dr. McCarthy's column on page 4, each year we have many more qualified applications than we can fund — for both research and educational activities.

Key to our current support are our faithful Order of Merit donors who give at least \$1,000 annually to support current research and educational programs. Many have given continuously for 10 or more years, which makes running our foundation and supporting current projects possible. They are the engine that drives us toward the future in which our endowment funds will sustain us.

We deeply appreciate both our Shands Circle members AND Order of Merit donors. We are most grateful to the many individuals who give to BOTH OREF's annual giving and endowment programs. They help us successfully manage this two-pronged approach to supporting research and education, and make the work of OREF possible.

Sincerely,

Gene Wurth,
President and CEO

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Joseph C. McCarthy, M.D.
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**OREF Welcomes its Newest
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*As of June 28, 2007

The Shands Circle and the Annual Campaign: Working Together to Fund Research and Researchers Today and Tomorrow

As chair of the Shands Circle, I am always happy to welcome new Shands-level contributors, and I am happy to report that as of June 28th, we've received 20 new Shands Circle commitments in 2007. For anyone considering becoming a Shands member, please see page 5 to learn the answers to some Frequently Asked Questions (FAQs) about making a Shands-level contribution.

As an orthopaedic surgeon I'm also concerned about the number of excellent grant applications our peer review committee turns down each year because we do not have the means to fund them. Each year, our Grants Board rates more than 140 applications for research grants. Typically about 25% of these applications fall within the fundable range, but we are only able to support about 15% because we do not have the financial resources to fund the rest. In 2007 OREF provided \$3.2 million to fund grants and awards it administers, and an additional \$2.9 million in research and education grants to various orthopaedic partners. We'd like to do even more to support research in 2008.

I encourage everyone in the Shands Circle to make a contribution to the 2007 Annual Campaign to support current research grants as I have. While funding the endowment is important, the 2007 Annual Campaign will support 2008 grants and awards. The box to the right shows you some of the advantages and ways to contribute.

Thank you to all of our Shands members, including those who have just joined the Shands Circle this year, for your generous support.

Sincerely,

Joseph C. McCarthy, M.D.
Chair, Shands Circle

Reasons and Ways to give to OREF's 2007 Annual Campaign

Your 2007 Annual Campaign contribution will fund grants in 2008 to help researchers uncover new methods to treat orthopaedic patients and improve patients' quality of life. Annual Campaign donors will be recognized with:

- An Order of Merit certificate and an Order of Merit badge ribbon, which can be worn at the AAOS Annual Meeting, for those who contribute \$1,000 and above.
- Acknowledgment at the OREF Exhibit at the AAOS Annual Meeting.
- Lapel pins.
- Listings in OREF's Annual Report.

You may contribute to the Annual Campaign by:

- Logging on to our secure online donation page: www.oref.org/donate.
- Sending your check or credit card information with the form on page 15.
- Contacting OREF.

Contact OREF

To learn how to join the Shands Circle, or for more information on how to make a major gift to OREF, please contact:

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wurth@oref.org

Ed Hoover
Associate VP,
Development
(847) 384-4354
hoover@oref.org

Shands Circle Frequently Asked Questions

What is the Shands Circle?

The Alfred R. Shands Jr., M.D. Circle was formed in 1994, at the same time OREF created an endowment as a way to fund orthopaedic research and education in perpetuity. The Shands Circle recognizes those who make substantial endowment contributions — \$20,000 or more in cash or stock gifts within a 5-year period, or \$50,000 or more in deferred commitments, made through bequests, trusts, charitable gift annuities, or life insurance policies.

Who makes up the Shands Circle?

About 490 contributors make up the Shands Circle today. Their contributions have a value of \$23.6 million in cash and more than \$42 million in planned gift arrangements.

What is the OREF endowment?

The OREF endowment is a portfolio of endowment funds, all established to support ongoing orthopaedic research and education. It comprises a general fund supporting OREF's mission that is directed by OREF's Board of Trustees, as well as more than 30 other funds, directed by orthopaedic partner boards.

Do I have to be a Shands-level contributor to give to the funds that make up the OREF endowment?

No. Annual Campaign Contributors can contribute to the OREF fund or to one or more of the orthopaedic partner endowment funds.

What is the difference between Annual and endowment giving?

Annual gifts are contributions received on a recurring, annual basis, and used to **fund current research and educational projects**. Annual funding serves as a bridge in two very important ways. First, it provides funding to help young researchers bridge the gap between their initial funding and more substantial funding from sources like the NIH. Annual support also serves as a bridge between the research we are able to fund today and the research we can fund in the future, when our endowment will provide more income on a permanent basis.

Endowment funds are permanently invested; only a portion of the earnings are used to support research. Endowment funds will support research and education long into the future. Annual funds support research today.

Ways to Make a Charitable Bequest

Making a bequest to a charitable organization, such as OREF, is not only a sign of benevolence; it is also the mark of savvy estate planning. There are many unique ways to make a gift in your will that can produce remarkable tax-saving benefits for your estate. More important, your bequest will become an enduring testimonial of your desire to help shape the future, and you will gain a kind of immortality that cannot be achieved any other way. Here are some popular bequests:

Direct bequest. By making an unrestricted gift, you allow OREF to apply the funds to our most pressing needs. You simply bequeath to us a given sum of money or other asset, and our Board of Trustees will then determine the best use of your bequest. Your gift can also be contingent. For example, you direct specific funds to go to an individual if that person survives you; otherwise, the funds are paid to OREF or a charitable organization of your choice.

Percentage or residue. You may choose to leave OREF a percentage of your estate or the balance remaining after bequests are made to your other heirs — the residue. A percentage will adjust for any substantial change in the value of your estate. This is especially practical if you are unsure what amount of money will be available from your estate.

Trust for spouse. By means of your will, you may want to place some or all of the residue of your estate under the management of a trustee for the benefit of your spouse in a "QTIP" trust. Your executor or personal representative must file an election on your estate tax return to create this trust. This special trust for surviving spouses stipulates that your spouse is to receive the trust income, together with principal advances if necessary, for his or her lifetime. At your spouse's death, all or part of the trust remainder will be distributed to OREF or a charitable organization of your choice.

Life income and lead trust plans. A charitable remainder trust provides that the trustee holds and invests the principal amount and pays a fixed or variable income to a named beneficiary or beneficiaries for life or a term of years. After that, the remainder is distributed to OREF or your choice of charitable organization. There are several types of life income plans from which to choose. An alternative to these plans is a charitable lead trust that pays OREF or a charitable organization of your choice a fixed or variable income for a designated term or a lifetime, after which the principal passes to your named beneficiaries. With either arrangement your estate can realize significant estate tax savings.

Memorial fund. You can establish a permanent memorial fund and the charitable organization will use the memorial fund's income as you specify. The principal will be invested to provide this income to the organization in perpetuity. The fund can be established in your name or in memory of another person.

How We Can Help

Please share with us your bequest intentions, by contacting **Gene Wurth** or **Ed Hoover**, so that we can thank you and, if you wish, discuss your desires for the use of the gift. We can also help you and your attorney formulate a plan to carry out your wishes and achieve valuable tax savings.

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OREF Clinician Scientist Seeking to Redefine Minimally Invasive

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“One of the biggest challenges we have as spine surgeons is achieving fusion,” Dr. Shen explained. “I am looking for ways of encouraging bones to knit together across vertebrae. Fusion is the ultimate goal for a wide range of clinical problems: for trauma to the spine, resulting in a fracture or instability; for stenosis, a narrowing of the spinal canal, which can result in instability and a need to stabilize the spine; in case of an infection or a tumor, when we often need to remove portions of the spine, and then put something else in its place.”

Today, orthopaedic surgeons depend on two main sources of tissue for bone grafts. Autologous (the patient’s own) bone does the best job of encouraging bone growth, but is limited in supply, extremely painful to extract, and is not always an option in cases of infection or tumor. The second source, cadaver bone, brings increased risk of infection, even if the tissue has been irradiated, and raises religious and other concerns for some patients. In addition, both procedures pose routine surgical risks.

“My research is looking for an alternative to both autologous and cadaver bone,” said Dr. Shen. “Perhaps by using pluripotential stromal cells from your own body — cells found in connective tissue with the ability to develop along different lineages — we can, for example, convince a fat-derived stromal cell to become a bone cell and then augment the process by using growth factors and by creating the right environment.”

Specifically, Dr. Shen is interested in understanding how certain growth factors encourage former fat cells to become bone cells, and how they induce biomechanical differentiation — taking on the form and function of a joint, tendon, or bone.

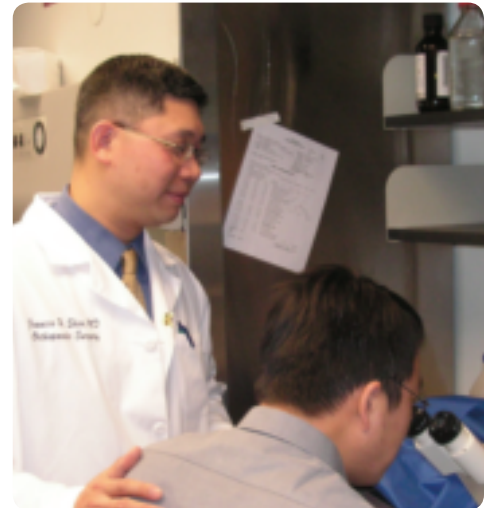
“Over the last three to four years we’ve demonstrated success in vitro, and in vivo in animals. I’ve been able to take certain cells, transfect them and actually grow bone cells, then have scaffold polymers resorb and leave a structure in their place that looks similar to bone — and is biomechanically similar to bone. We’re doing this now in animals so, hopefully, in the next three to five years we may be able to be in clinical trials in humans. The possibility of delivering a protein by percutaneous injection to a patient in need of fusion or disc regeneration, with fewer side effects than surgery and far greater gains achieved, may not be very far off.”

“We will all be patients one day, as will our kids and our grandkids. That’s why the research that OREF funds is so important. Our profession — and quality of life for each of us — depends on research.”

Francis H. Shen, M.D.

Dr. Shen also sees an opportunity to uncover new treatments for diseases that target bone tissue by learning more about how bone breaks down.

Bone is living tissue, and in a healthy body, there is an equilibrium between bone cells being made and bone cells being resorbed. Recently, Dr. Shen has given more consideration to the



Dr. Shen and one of his postdoctorate research associates, Qing Zeng, M.D., review cell phenotypes with the help of a high-power microscope.

process of bone resorption, which occurs in diseases such as osteoporosis, osteopenia, osteolysis, and in cancer and tumor cells.

“Imagine that we learn how bone breaks down and why, and identify ways to halt the breakdown and combine that with what we are learning about the ability of certain cells under certain conditions to make bone. There may well be gains to be had by looking at both ends of the bone process.”

Dr. Shen is currently looking at breast cancer cells, which are known for being aggressive in breaking down bone. Working with endocrinologists, using human breast cancer cells in animals, Dr. Shen will develop a spinal metastases model. Eventually, he hopes to find ways to retard or even reverse the breakdown of bone tissue in breast cancer patients.



Dr. Shen reviews cervical spine images with team members Ruby Ford, R.N., head nurse (left), and Tina Adkins, nursing assistant (right).



Dr. Shen visits with a patient during office hours.

For Dr. Shen, research practice and clinical practice are one in the same.

“In our lab, everything we do contributes to improving the quality of life for our patients — and for ourselves, because we will all be patients one day, as will our kids and our grandkids. That’s why the research that OREF funds is so important. Our profession — and quality of life for each of us — depends on research.”

In addition to recognition and support from OREF, Dr. Shen’s work has been

advanced through support from the Orthopaedic Trauma Association, the North American Spine Society, the University of Virginia Research and Development Foundation, the Scoliosis Research Society, AO International Foundation, *The Spine Journal* and the Musculoskeletal Transplant Foundation.

Prior to his current responsibilities at the University of Virginia School of Medicine, Dr. Shen practiced as a fellow in spine surgery at Rush University, Chicago; as

a fellow in pediatric spine deformity surgery at Shiners Hospitals for Children, Chicago; and as a resident in orthopaedic surgery at the University of Virginia, where he earned his medical degree in 1996. Prior to medical school, Dr. Shen graduated the University of Michigan College of Engineering with a bachelor’s degree in biomedical engineering.

OREF Clinician Scientist Award Now in Its Fifth Year

The OREF Clinician Scientist Award was established by **Dr. Zachary B. and Mrs. Kathleen Friedenberg** in 2003 to encourage young orthopaedic surgeons to pursue careers as clinician scientists, with a special emphasis on continued research. After the creation of the first award, **Dr. Dane and Mrs. Mary Louise Miller** and *The Journal of Bone and Joint Surgery* also established Clinician Scientist Awards. The **Dr. Dane and Mrs. Mary Louise Miller Endowment Fund** will support Dr. Shen’s Award.

Clinician Scientist Awards provide an annual stipend of \$100,000 for three years to compensate for the loss of income associated with devoting more time to research, and less time to clinical practice. In return, OREF Clinician Scientists are asked to devote extensive time to research, serve as role models for orthopaedic residents, interns, and medical students, and organize and participate in conferences.

Getting to Zero: How OREF-funded Research Fits in the Fight to

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and immediate postoperative wound provides an excellent environment for the development of infection.”

Because of the danger of wound sepsis, it is important for doctors to control the threat of possible airborne contamination. This had already been a topic of debate for about a century when Total Joint Replacement (TJR) emerged in the late 1960s. Infections can develop at the site of TJR prostheses months or even years after the operation, a complication that may lead to costly revision surgeries, which are traumatic for patients. Some surgeons thought reducing contamination during surgery should reduce the risk of immediate, or intra-operative, infections as well as the risk of periprosthetic infection.

To avoid the potential complications of intra-operative infections, orthopaedic surgeons began practicing several precautionary measures. These measures included: administering antibiotics prophylactically; requiring surgical teams to wear whole-body, exhaust-ventilated suits to control the amount of contamination they transferred to the patient during surgery; reducing operating room traffic; carefully preparing and cleaning the operating room and the wound site; covering exposed hair and skin; and using double gloves.

The Advent of Laminar Air Flow

In the 1960s, **Sir John Charnley, M.D.**, an orthopaedic surgeon at Wrightington Hospital, Lancashire, United Kingdom, who was renowned for inventing low-friction hip arthroplasty — the first truly successful total hip replacement procedure — introduced a clean air

enclosure. The enclosure filtered air coming into the operating room to remove small bacteria-laden particles. Dr. Charnley’s thought, according to Dr. Amstutz, was that preventing contamination in the operating room atmosphere could reduce the potential for intra-operative infection among joint replacement patients, and perhaps negate the need for prophylactic antibiotics.

Dr. Charnley’s laminar air flow system recirculated a continuous flow of highly filtered, bacteria-free air under positive pressure in the operating field and removed air contaminants generated during surgery. In the 1970s, orthopaedic surgeons debated whether such an air flow system truly reduced the risk of infection. As Dr. Amstutz began his career at UCLA, he found that university operating rooms lacked laminar air flow systems, and decided it was an excellent opportunity to research the value of the technology.

“What we wanted to do was to equip the rooms with laminar air flow and measure how effective it was over the old, standard operating room, with the idea that perhaps antibiotics would not be necessary following surgery if your operating room was quite sterile,” Dr. Amstutz explained.

Enlisting the expertise of **Harry Buchberg, M.S.**, an engineer in the UCLA School of Engineering, Dr. Amstutz set out to control the operating room environment and to compare the air quality in the old versus new operating rooms to learn if there was, in fact, a reduction in contaminated particles using the laminar air flow system. He would

also investigate the hood system, also developed by Dr. Charnley, to see how much further it could reduce the chances of intra-operative infection.

With Mr. Buchberg’s help, Dr. Amstutz designed a study using the Reyniers Slit Sampler to test the air in the operating room.

“The Reyniers Slit Sampler samples the air, counting the number of particles, which are then plated on blood agar,” said Dr. Amstutz. “The bacterial colonies are counted and the type of organisms identified to determine the level of circulating contamination that could potentially cause an infection.”

Dr. Amstutz collected data from the existing operating rooms before and after he had the laminar air systems installed and noted a precipitous drop in organisms.

“We were just doing joint replacements in the existing rooms, covering our patients with antibiotics and trying to do everything we could to minimize the risk of infection,” Dr. Amstutz said. “Fortunately, with antibiotics the incidence, and thus the infection rate, was low: less than 2%.”

A Clean Environment

The research grant Dr. Amstutz received from OREF aided this study which also gained the attention of NASA.

“Harry Buchberg was a consultant for NASA, which became involved because they needed the best clean rooms available to do studies that would dictate what the protocol should be for their space programs. So NASA was extensively involved in this clean room technology.”

Eliminate Intra-operative Infection

In addition to the interest from NASA, and a discussion of results at several symposia, the findings of the OREF-funded study were published in the September 1975 issue of *Clinical Orthopaedics and Related Research*.

"We were able to reduce the infection rate to less than 1%, but decided to continue with prophylactic antibiotics," Dr. Amstutz said of the results. "It correlated with the reduction of particles. Additionally, the organisms identified were less virulent than in the old rooms. That led to further studies in terms of effectiveness of horizontal laminar flow versus vertically oriented flow, which Charnley favored, to prevent infections."

This resultant investigation showed that the horizontal system had the advantages of simplicity, lower cost, and the possibility of providing unobstructed purging of the wound for hip surgery. The vertical system, according to Dr. Amstutz, makes it virtually impossible to protect the wound from being contaminated by the surgical team unless each member of the team is isolated by an all-inclusive garment with an aspirator or body exhaust system. Yet, some later studies showed slightly lower contamination rates than those found with a horizontal system. Overall, however, Dr. Amstutz found the contamination rates of both systems to be low.

An Ounce of Prevention

The initial hypothesis of the laminar flow research was that in a sufficiently clean operating environment the use of antibiotics would be unnecessary.

Today most surgeons take advantage of both measures to prevent infection.

"It turns out that there's not really a good enough reason to stop using antibiotics, although there is always a concern that if you continue their use, you will end up with resistant organisms," Dr. Amstutz explained. "But most of us really want to prevent infection, so most surgeons try to get that environment as modern as possible — with a high rate of air exchange to purge the OR of contaminants — and they also use antibiotics."

Dr. Amstutz said that he quickly understood the importance of initial research in building the case for further investigation, as occurred with his OREF grant.

"When I came to UCLA, I was still quite young. Even as chairman, when you arrive at the university, they give you a title, authority, and some salary lines for faculty. They do not provide money for research so you have to seek grant support. **The OREF grant was one of the first we received at UCLA, and it was definitely the catalyst that allowed us to activate our study to assess the reduction of organisms in the operating room following installation of a laminar flow system. I made the case that through this study we might prove that laminar flow was a step toward eliminating intra-operative infections.**"

Stimulated by his research grant, Dr. Amstutz studied other causes of infections and ways to prevent them. He developed a research program that

involved residents, fellows, internal medicine, infectious diseases, and engineering. This multi-disciplinary group received several NIH grants in the bioengineering field.

But the important aspect of any research, Dr. Amstutz said, is how it ultimately affects patients. His original OREF-funded laminar flow research is no exception.

"Although infections can still occur years after surgery, what we were trying to prevent was an intra-operative infection of any joint replacement. For TJR procedures done today, the risk of infection is considerably less than 1% for most operating room environments in most large centers," said Dr. Amstutz. "But ideally, of course, we would like it to be zero. The work continues."



Harlan C. Amstutz, M.D.

Kyphon's Commitment to Research Thanks Physicians, Patients for

With a mission to help physicians advance orthopaedic treatment and care to improve the quality of life for patients, **Kyphon's** objectives to support research intertwine with those of OREF, stimulating the corporation's commitment as a Platinum Level Corporate Associate.

Founded in 1994 around one concept — a minimally invasive method to repair spinal fractures caused by cancer and osteoporosis — Kyphon's driving philosophy, according to **Karen Talmadge, Ph.D.**, co-founder, chief scientific officer, and executive vice president, is strongly formed around both research and education.

"We began around one concept and had to take it from scratch," Dr. Talmadge said. "We believe strongly in evidence-based medicine and support all of our products with clinical trials to answer important clinical questions. That's part of who we are and part of our founding concept and our operating principles."

From the first balloon kyphoplasty — a procedure in which orthopaedic balloons are used to gently raise a vertebra in an attempt to return it to its correct position — Kyphon grew, adding to its products procedures for diagnosing the source of low back pain and treatments for lumbar stenosis.

"We started out very, very small but we now have 1,200 employees and operate in more than 40 countries worldwide," Dr. Talmadge said. "As we grew we recognized that we were going to become a fully functional medical device company, and it became very important to us to contribute in many ways."

Kyphon launched a philanthropic initiative in 2004 to support local and

international causes to improve quality of life for people in need. To meet this objective, Kyphon made contributions to non-profit organizations such as the Ronald McDonald House Charities. At the same time, Dr. Talmadge said, they recognized the need to give back to the medical community. The commercial success they'd achieved, she said, came from the support of physicians who used Kyphon products and from the patients whose testimonials showed they appreciated the care those products delivered. So it seemed right to her that Kyphon should give back in a way that benefits physicians and patients — by supporting neurosurgical and orthopaedic research.

"There's nothing more satisfying and fulfilling we can do than help physicians and patients make informed decisions about medical care," Dr. Talmadge said. "We've been commercially successful and our business has benefited greatly from physicians and patients. There's no better way to contribute as a thank you and as a commitment to society than to support research because of how it will benefit those physicians and patients."

Commitment, Dr. Talmadge said, is among Kyphon's six core values, which also include trust, loyalty, respect for others, honesty, and integrity. But it is commitment that coincides with Kyphon's decision to support orthopaedic research through OREF.

"Partnering with OREF certainly pertains to commitment. We have a commitment



Kyphon headquarters, Sunnyvale, California

to patients and we have a commitment to physicians, and partnering with OREF allows us to provide for them in a way that fulfills our desire to be good corporate citizens and to give back to the medical community," Dr. Talmadge explained.

In addition to aligning with one of Kyphon's core values, Dr. Talmadge said, working with OREF also represents teamwork, which is an integral part of Kyphon's corporate philosophy. It also allows Kyphon to help physicians and patients in a way that they could not do by themselves.

"In the broader scheme of things, we're all on the same team which is to help patients. And we each contribute in our different ways. By partnering with OREF, we create a team that broadens the ability to help society and patients and medicine in general."

Dr. Talmadge stressed that supporting research through OREF allows Kyphon to help the orthopaedic community as a whole, but doesn't directly benefit the company.

"We specifically do not want to support research that directly benefits Kyphon

Helping it Succeed



Kyphon displayed its innovative technology during the 2007 American Academy of Orthopaedic Surgeon's Annual Meeting in San Diego.

because from our perspective, that doesn't give back to the community," Dr. Talmadge said. "It's very close-minded and short-termed thinking to just focus on one specific product and to think only about the benefits to your corporation. It benefits everybody the more we understand about mechanics, the more we understand about anatomy, the more we understand about the impact of various treatments, on various patients, in various disease

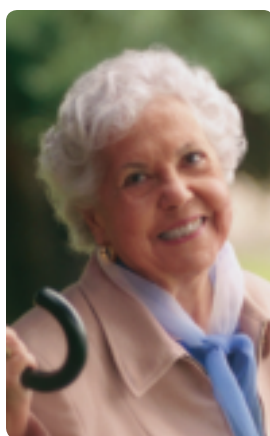
No matter the circumstances that caused their spinal pain, many patients have found relief from balloon kyphoplasty procedures.



Gerry Ragen
Retired elementary school teacher and supervisor
Fractures due to osteoporosis.



Tom Callaghan
Attorney
Multiple fractures due to multiple myeloma.



Joan Schoengold
Retired hospital administrator
Fracture due to osteoporosis.

states, with various comorbidities. And that's the kind of research that OREF supports."

Dr. Talmadge said that many questions need to be answered that aren't product-focused, and they can be answered through OREF-funded research. She sees OREF's role much differently than that of the National Institutes of Health (NIH), which, she says, often focuses on more basic science studies.

"The NIH is not strong on supporting the truly clinical applications of various procedures and devices, and their impact on patients," Dr. Talmadge said. "OREF has a very important role in translating basic research to patients."

One of the major motives for Kyphon to fund research through OREF, Dr. Talmadge indicated, is the Designated Giving Program, which

allows corporations to fund research through OREF to more than 30 orthopaedic partners.

"We've looked at OREF as the parent organization of all of these smaller spine groups, and we're more likely to support research through OREF because of its program that allows us to specify that our research funds would go to these satellite organizations such as the North American Spine Society and Scoliosis Research Society."

"We have a commitment to patients and we have a commitment to physicians, and partnering with OREF allows us to provide for them in a way that fulfills our desire to be good corporate citizens and to give back to the medical community."

Karen Talmadge, Ph.D.

The bottom line, however, Dr. Talmadge said is that Kyphon wants to make a difference in patients' lives by giving back to the orthopaedic community and contributing to OREF gives them a means to make that difference.

"We have a true commitment to evidence-based medicine, and to basic research, but we are not a basic research company, so by working with OREF, we can honor both of those commitments in a philanthropic way."

2006 Corporate Associates

OREF is proud to acknowledge these companies for their generous support. A strong and productive alliance with industry enables OREF to fund quality programs that advance the orthopaedic profession, ultimately leading to improved patient care.

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VP, Corporate Relations
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sherr@oref.org

Ivy Gard
Corporate Relations
(847) 384-4355
gard@oref.org

New and Innovative Ways OREF Has Collaborated with Industry

Stryker Corporation

Stryker Corporation continues to support OREF as a **Platinum Level Corporate Associate** through its annual commitment of more than \$350,000. Naming rights have been provided, giving Stryker the prominent display of its name with distinguished major research grants and on select educational materials disseminated to orthopaedic surgeons. In 2007, Stryker funded four grants, the topics of which include: the role stress plays on the tendon-bone insertion site; metastatic spine tumors; growth and metastasis of osteosarcoma; and fracture healing.

Thomson PDR

Through a unique partnership between OREF and **Thomson PDR, Ferring Pharmaceuticals** provided sponsorship support to co-brand the first **PDR Orthopaedic Prescribing Guide**. The Guide was developed by Thomson PDR, with guidance from OREF's Corporate Relations Committee, and sent to each AAOS Fellow in January 2007.

DePuy Orthopaedics

DePuy Orthopaedics, an OREF **Platinum Level** partner, provided an educational grant to OREF to develop an article entitled "**Essential Guidelines, Regulations and Ethical Considerations: The Evolving Relationship between Orthopaedists and Industry**." OREF provided oversight and peer review for the article, which appeared as a supplement in the February 2007 *Journal of the American Academy of Orthopaedic Surgeons*. The article is now available at www.oref.org and will be distributed at major orthopaedic meetings.

DePuy & Ruth Jackson Orthopaedic Society (RJOS)

DePuy Orthopaedics, RJOS, and OREF partnered to establish the new **RJOS/OREF/DePuy Career Development Award in Women's Musculoskeletal Health**. The first recipient is **Vonda Joy Wright, M.D.**, Assistant Professor, University of Pittsburgh.

Wright Medical Technology

Through OREF's new Independent Peer Review Service, **Wright Medical Technology**, an OREF **Platinum Level Corporate Associate**, submitted four research proposals for review by OREF's Peer Review Committee. Each proposal was scrutinized to ensure scientific merit, and all ranked within the fundable range. Research will examine: advanced delivery of antibiotics; performance of bone graft substitutes; porous metal materials for bone growth; and porous coating morphology and fixation techniques.

Pfizer

Through an educational grant, **Pfizer**, an OREF **Platinum Level Corporate Associate**, the **American Orthopaedic Association** and OREF implemented a **Pain Management Initiative**. This project will identify significant gaps in research and education related to post-operative pain management for sports, spine, and total joint-related surgery. Findings will be published later this year and made available to the orthopaedic community.

Every Academic Program Should Support OREF 100%



More than 20 years ago, when he was Chair of the Department of Orthopaedic Surgery at SUNY Upstate Medical University, **David Murray, M.D.**

made the decision that his entire Department should contribute to OREF. It was the first institutional contribution OREF received. The contribution came from Department funds and was made in the names of the individual Department members.

"Not too long after that first contribution, I was elected to the OREF Board and promoted the idea to anyone who would listen — i.e. every academic program should support OREF 100%," Dr. Murray said.

Stephen A. Albanese, M.D., current Chair of the Department of Orthopaedic Surgery, continues SUNY Upstate Medical University's tradition of giving to support orthopaedic research.



"When I became Department Chair in 2000, I decided to continue the Department policy that had been started by Dr. Murray. I believe that the members of our Department recognize the value that OREF has brought to our specialty and support the Department's involvement. Patients directly benefit from the advances in care that result from high-quality research. OREF has been instrumental in the research program development for many of our specialty's leading scientists."

OREF thanks all institutions, departments, hospitals, and physician groups that made contributions in 2006. For a complete list, please see page 14.

Institutions/Departments, Hospitals & Physician Groups

Your contributions in 2006 are greatly appreciated. Please renew your support in 2007.

“OREF is the pre-eminent organization supporting young orthopaedists who have an interest in research. Considering this point and that research OREF has funded has directly improved how we practice — it’s hard to understand why every institution doesn’t offer generous support.”

– **Marc F. Swiontkowski, M.D.**, Chair, Department of Orthopaedic Surgery, University of Minnesota

\$100,000 & above



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Orthopaedic Associates**, Boston, MA
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Department of Orthopaedic Surgery**, New York, NY
SUNY Upstate Medical University**, Syracuse, NY
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University of Iowa Hospitals**, Iowa City, IA
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University of Rochester Medical Center**, Rochester, NY
University of Wisconsin Hospital & Clinic**, Madison, WI

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* Denotes 100% Participation

** Denotes 100% Order of Merit Participation

Please Support OREF's 2007 Annual Campaign



The **most cost-effective** way for OREF to process your donation is through our **secure online donation** form at www.oref.org/donate

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Order of Merit—Platinum	\$5,000 & Above
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D Designated Giving Program for Annual Giving*

Order of Merit members (contributions of or exceeding \$1,000 annually) have the opportunity to designate support for specialty societies through their annual contribution to OREF.

NOTE: Contributions less than \$1,000 may not be designated.

I understand that a minimum of **\$500** of my annual Order of Merit contribution is **reserved for** OREF. I have indicated below the total amount I'd like to designate to OREF and to these specialty societies:

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Applications for 2008 OREF Funding Now Available!

OREF is pleased to announce that applications and instructions for all Grants and Awards are currently available at www.oref.org/grants.

Application deadlines are Oct. 1, 2007 for most programs, with funding to begin in 2008. Please visit www.oref.org for more details.

Special Opportunity for 2008: Clinician Scientist Award — \$100,000 per year for up to three years

Clinician Scientist Awards encourage young surgeons to pursue careers as clinician scientists, with a special emphasis on continued research activity. The award will be made to an orthopaedic surgeon to allow the recipient to spend 40% or more of his or her time (two workdays each week) on research.

2007 Clinician Scientist Award recipient Cristin M. Ferguson, M.D. on the benefits of research:

Replacing the structure in the knee responsible for stability and cushioning may become easier with longer-lasting results because of research conducted by Dr. Ferguson.

"I'd like to understand why people tear their meniscus and why the meniscus wears out. Research allows me to ask these questions and, over time, answer them. It expands our knowledge so we can better treat patients."

