



discovering the future of orthopaedics

Advancing the Future of Patient Care Stryker continues tradition of supporting research

In the past three years, Stryker has provided **more than \$1 million in unrestricted funding to OREF**, which reflects the highest level of unrestricted corporate support from any orthopaedic company.

Patrick Anderson, Stryker's vice president of strategy and communications, explains that, "At Stryker we believe research is a critically important part of the ongoing evolution and development of the orthopaedic industry, and the broader medical device industry as well."

According to Mr. Anderson, corporations such as Stryker want to persistently validate the products and procedures they produce, while remaining open to new ideas and methods that could improve outcomes for patients.

"It benefits Stryker and the industry as a whole to continually ask, 'Are our current products and procedures as effective as they potentially could be?' And to always have a healthy dissatisfaction with the current status quo to enhance the outcomes of orthopaedic surgery," Mr. Anderson said.

Dr. Stryker, the Inventor

These theories about supporting research come from a long tradition at Stryker, a tradition that was started by **Homer Stryker, M.D.**, the company's founder. Dissatisfied with some of the products he was using, Dr. Stryker began inventing new products, hoping to provide his patients with better care.

"Dr. Stryker was a very inventive man," Mr. Anderson said. "He grew up on a farm and was intellectually curious. He liked mechanical objects, and he liked to find new ways to use them in his medical practice."



Dr. Stryker's original Cast Cutter allowed doctors to remove casts easily without injuring their patients.

Dr. Stryker sought solutions to several problems in the medical industry. One of his first inventions, the Walking Heel, provided mobility for patients who had broken their legs and had to be in casts. With another of his inventions, the Turning Frame, Dr. Stryker found a way to easily turn patients to reduce blood clots and skin problems for those confined to hospital beds for extended periods of time. And, although it has been updated

Current day version of Dr. Stryker's Cast Cutter



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OREF Improves Web Site

Web changes make giving easier, and show the value of research



Charles A. Rockwood Jr., M.D.
Board Chairman

About Impact

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Pat Cichlar, R.N., Executive Director of the Orthopaedic Learning Center, provided medical review for this issue of *Impact*.

Please direct comments about this publication to communications@oref.org

If you haven't had a chance to visit OREF's Web site recently, I encourage you to do so. Here's why:

- In my six-plus years on the OREF Board, I have constantly challenged staff (and other Trustees) to help us do a better job in explaining the practical applications of the research we fund. Now available on our Web site are more than 20 examples of how OREF-funded research has helped orthopaedists practice the specialty we love. The examples are to the point and primarily organized by body part. These important research investments have significantly improved patient care.
- More and more not-for-profit organizations that are similar in size and scope to OREF are realizing tremendous growth in their fund-raising programs, in no small part because of how they are using their Web sites. OREF is lucky to have more than 200 volunteers, a lay Board of 22 members, and the governing Board, over which I preside, comprised of 22 members. That's 244 people — plus any of you — who can now use sophisticated fund-raising technology through www.oref.org to help us raise money.
- You can make your own contribution to OREF's Annual Campaign and designate to one or more of our 30 designated giving partners at www.oref.org/donate. Soon, we'll have the ability to book your pledges for subsequent years online. This will make it easier on you (we'll stop sending you four or five fund-raising solicitations via the postal service). This will allow OREF to fund more research. At the suggestion of one of our longtime Annual Campaign contributors, we will be adding the ability to accept funds directly from checking accounts, thereby avoiding bank charges for credit card gifts.
- Visitors to www.oref.org can also learn about Planned Giving options. Planned Giving refers to various kinds of trusts, estate planning and so forth — the means by which you can think about making a large commitment. *Planned Giving is really all about family*. And it's about how OREF can help you optimize your ability to take care of your loved ones, OREF, and other not-for-profits that you care about. Just click the Planned Giving tab from our home page.

Here's an example. If you have friends who do not support OREF because they do not see the practical value of OREF-funded research, you can now use the convenient **send this page to a friend** link to easily forward one of the relevant practical application examples that will show them how the accomplishments we've made have helped them achieve what they have.

It's exciting to think of how the research we've funded has improved the practice of orthopaedic medicine. It's just as exciting to think about how, over time, www.oref.org will help us fund a lot more research and educational programming, from which we will all benefit.

Sincerely,

Charles A. Rockwood Jr., M.D.
Board Chairman

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OREF Endowment Shows 66% Growth in Three Years

With your support, OREF has in the last three years raised the cash value of our Endowment from \$13.4 million to a total of \$22.3 million as of August 1, 2006 — a 66% increase. At this writing, the total value of the OREF Endowment is \$80.4 million, which includes the cash total plus pledges of \$15.7 million and \$42.4 million in deferred gifts.

The OREF Endowment may best be thought of as a centralized endowment that has many specific funds that support specialty orthopaedic organizations, or pay tribute to renowned leaders in the orthopaedic specialty. In addition to this, the OREF Endowment has an unrestricted fund, and the income of that fund is directed by the OREF Trustees. (For a complete list, please visit www.oref.org/endowments.)

More than 35 orthopaedic organizations have their endowment funds managed as dedicated funds under the OREF Endowment umbrella. Why? Because OREF can provide endowment campaign strategy and implementation, and concise reporting of gifts to the funds, as well as the performance of the funds. And by all comparisons, the OREF Endowment — under the direction of the Finance Committee — has performed very well.

When a physician and his or her spouse commits a major gift to OREF, we ask that a generous portion of the commitment be directed to the unrestricted portion of the OREF Endowment. Donors may also direct part of or their entire gift to one or more of the specific endowment funds managed by OREF. These endowment funds, each of which has its own unique purpose for the good of the organization, include

Alfred R. Shands Jr. Circle Platinum Donors — \$ 1 Million & Above

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specialty organizations, a few regional orthopaedic societies, and some professional organizations such as clinics or hospitals. Endowment funds are created to receive gifts with the intent that all of the money contributed will be reserved in principal, and only the interest from the money will be used to support research and educational programs.

The vehicle for orthopaedists to make major gift commitments to fund the OREF Endowment is through the Shands Circle. The box above recognizes our **Shands Circle Platinum members** — those who have made cash or deferred commitments that exceed \$1 million to whom we extend sincere thanks.

While we are all very proud of the growth of the OREF Endowment, I must also stress the need to continue to support OREF's Annual Campaign. **It is primarily through your support of the 2006 Annual Campaign that OREF will fund peer-reviewed research and education grants in 2007.**

Sincerely,



Gene R. Wurth
President and CEO



Gene R. Wurth
President and CEO

Contact OREF

For information about making a major gift to OREF, please contact:

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(847) 384-4362

Ed Hoover
hoover@oref.org
(847) 384-4354

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Joseph C. McCarthy, M.D.
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Support 2007 Research with a Contribution to the 2006 Annual Campaign

The number of projects that OREF is able to fund in a given year depends to a great degree on unrestricted contributions made to the Annual Campaign in the previous year. Many more worthwhile projects can be funded with our help, and **I encourage everyone in the Shands Circle to make a contribution to the 2006 Annual Campaign to support current research grants as I have.**

Your Shands Circle contributions support the OREF Endowment, which is comprised of an unrestricted fund for OREF, and more than 30 other funds for specific causes that benefit the larger orthopaedic community. Funds to the Endowment are permanently invested; only the income is used annually to support research.

While funding the Endowment is important, the 2006 Annual Campaign will support next year's research grants and awards. In recent years, OREF has been able to fund only about half of the qualified grant applications we receive. In 2006, OREF provided \$2.4 million to fund 130 grants and awards, and an

additional \$2.1 million in research and educational programs through various specialty orthopaedic organizations. With your contribution, we could fund even more in 2007.

Approximately 80% of Shands Circle members contribute to the Annual Campaign each year. We'd like to make that 100%. Your Annual Campaign contribution will help tomorrow's researchers uncover new methods to treat orthopaedic patients and improve those 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
- Acknowledgments at the OREF Exhibit at the AAOS Annual Meeting
- Lapel pins
- Listings in OREF's Annual Report
- Recognition on www.oref.org



The Best is Yet to Come... Planning for Your Retirement

"...you've finally earned the right to enjoy your retirement. It's tough to relax, though, if you're not sure your nest egg is large enough to last for the rest of your life."

Q. I've just entered the prime of my life — retirement. How can I make sure I won't outlive my resources?

A. You've spent much of your life working, and you've finally earned the right to enjoy your retirement. It's tough to relax, though, if you're not sure your nest egg is large enough to last for the rest of your life.

Here are two options to consider:

Stocks. Stay invested in stocks — especially if you're a recent retiree. Though the stock market can be volatile, stocks tend to outperform bonds over the long haul. Many funds offer a growth-for-

income plan. You invest a lump sum in a growth fund and request a check for a set amount or percentage of assets each month or quarter.

Charitable life income plans.

You can combine your personal, financial, and charitable goals by setting up a life income gift, such as a charitable gift annuity* or charitable remainder trust. You can donate appreciated stocks, real estate, or cash to your favorite charitable organization(s), which in turn **will provide you with payments for the rest of your life.** In this way, a charitable gift annuity or charitable remainder trust can be a great retirement planning tool, as well as a legacy. You'll also receive a tax break the

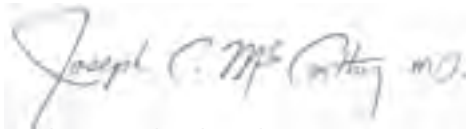
"The number of projects that OREF is able to fund in a given year depends to a great degree on unrestricted contributions made to the Annual Campaign in the previous year."

You may contribute to the Annual Campaign by:

- Logging on to **www.oref.org** and clicking the Donate Now tab
- Sending your check or credit card information with the form on page 15
- Contacting **Ed Hoover**, Director, Annual Giving

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.



Chairman, Shands Circle Committee

Contact Shands Circle

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

Gene Wurth,
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at (847) 384-4362
or wurth@oref.org
or **Maureen Corcoran**,
Director, Shands
Circle Programs, at
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or corcoran@oref.org

For Annual Campaign inquiries please contact:

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year you make the donation. At the end of your life, the organization gets the balance and estate tax is avoided.

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- Your investment time horizon (mainly, your age and retirement objectives)
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**Not available in all states or from all organizations*



Dr. Miller: Cracking the Code for Idiopathic Scoliosis

OREF Career Development Award is the key to continuing the search for what causes spinal deformity, generation after generation

Research Summary

Nancy H. Miller, M.S., M.D.

2001 Career Development Award recipient



Nancy H. Miller, M.S., M.D.

Topic:

Studying which genes cause familial idiopathic scoliosis, and what specific mutations lead to the disease.

Result:

Chromosomes 1, 6, 8, 9, 16, and 17 showed the strongest linkage to idiopathic scoliosis.

Potential Patient Care Application of Results:

Potential screening for at-risk individuals, development of more specific treatments through tailored therapies and counseling, and an increased understanding of how genetics influence spinal growth and stability.

The diagnosis of familial idiopathic scoliosis, the condition of side-to-side curves in otherwise normal spines, is heading toward a breakthrough. **Nancy H. Miller, M.S., M.D.**, associate professor, department of orthopaedics at Johns Hopkins University*, is leading the way.

In generation after generation, scoliosis brings certain families physical deformity and emotional pain, both of which can be severe. Familial idiopathic scoliosis affects 2% to 3% of the population; 90% of the patients who necessitate surgical intervention are female. There is no cure, and only bracing and surgery are available for treatment.

Dr. Miller is renowned for her work — as a researcher, teacher, and clinician — to decipher the genetics of scoliosis, a condition she first encountered as a pediatric orthopaedics resident at Boston University.

“When we got down to the scoliosis clinic in the hospital, all these kids — all these pre-adolescent females — wanted a woman resident,” Dr. Miller said. “I was intrigued. But my real interest in going after scoliosis came from working with Dr. Ponseti.”

Just prior to the emergence of molecular genetics, Dr. Miller began looking at the pathology of scoliosis as a research fellow under **Ignacio V. Ponseti, M.D.** at the University of Iowa. She devised a series of experiments examining the ligaments of the spine, a highly organized network of elastic fibers that connect the bones of the spinal column.

“There was a thought that perhaps the elastic fiber system had something to do with the development of scoliosis. It could be easily looked at, because one of the ligaments in the spine has a significant percentage of elastic fibers. So you could take that to the laboratory and look at it through a microscope. You could look at the cells

and how they expressed different aspects of the elastic system. It turned out to be relatively fruitful.”

As Dr. Miller moved into clinical practice, her focus turned to how individual proteins that make up spinal ligaments — including collagen, elastin, and fibrillin — affect spinal stability. **This work was supported in part by a 1991 OREF Research Grant.** Soon, genetic investigation became possible. Dr. Miller began gathering data and insight on families, at the point when researchers working on the human genome project had identified some genes, by making visits to families with a history of scoliosis.

“Patients have become much more knowledgeable regarding their conditions and current research efforts. Choices are going to be made by patients, influenced by how much their surgeons know.”

“On one of the family visits, the grandmother ran out of the room in tears. She has five beautiful granddaughters, and three of them are in braces. I think it hit her that she’s the one with scoliosis; she feels responsible.”

Candidate-gene and, later, sequencing studies led to Dr. Miller receiving the **2001 OREF Career Development Award.** The \$225,000 OREF Award made it possible for Dr. Miller to assemble a critical mass of data,



Nancy H. Miller, M.S., M.D. (left) and Laboratory Administrator and Technician, Beth Marosy, M.S., pose near an X-ray of a scoliosis patient. Dr. Miller is holding the model she uses to explain scoliosis when she visits families.

“There would be no way I could have done this without the OREF Career Development Award. It was a big step up.”

and current research efforts. Choices are going to be made by patients, influenced by how much their surgeons know.”

*Dr. Miller will be Professor of Orthopaedics, University of Colorado, Denver in October 2006. ■

which was the basis for securing critical support from the Center for Inherited Disease Research (CIDR) — in excess of \$2 million — for a genome-wide scan of the entire population under study. It was one of the largest projects their review board had approved.

“I had identified the disease. I had my population. My population was very well described through highly detailed clinical information. I actually had the genome-wide research in hand with the statistical package behind it. That’s when NIH said, ‘We’ll fund you,’ at a time when funding for studies of complex disorders was difficult to obtain.

There would be no way I could have done this without the OREF Career Development Award. It was a big step up.”

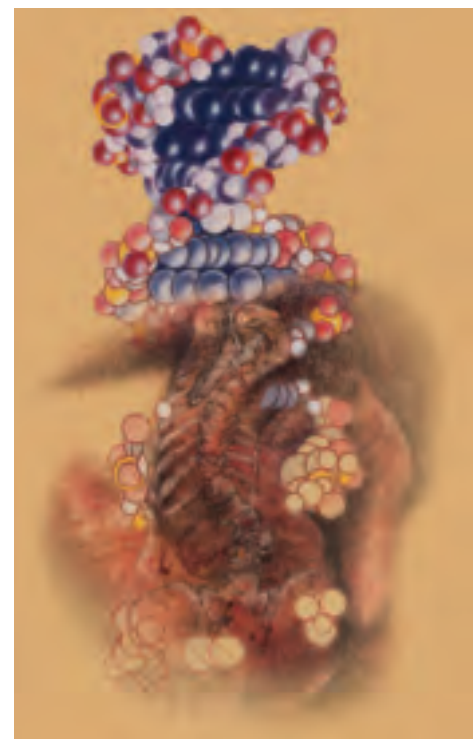
Since then, promising pathways have surfaced. By 2005, chromosomes 1, 6, 8, 9, 16, and 17 showed the strongest linkage to idiopathic scoliosis. Now Dr. Miller is about to publish evidence that chromosomes 5, 13, and 19 also figure in.

Building blocks for a cure are yet to come. Still, Dr. Miller believes her research is a source of hope. Even for families for whom answers will come too late, knowing that the research is continuing brings some comfort.

“One woman called me and wanted to know where we were on our research. She and her husband had already decided, due to her scoliosis, not to have children. ‘I couldn’t have children,’ she said. ‘My life is just misery from day to day. I’ve had five back surgeries and I’m not even 40. I couldn’t give this to anybody.’”

Looking forward, Dr. Miller sees the possibility of a screening test and more specific therapeutic options to help larger numbers of families. But more research — and more funding — are needed. Dr. Miller says all orthopaedic surgeons have a vested interest in supporting OREF.

“To be a better clinician your knowledge base in orthopaedic research needs to have a foundation. Patients have become much more knowledgeable regarding their conditions



Advancing the Future of Patient Care

Stryker continues tradition of supporting research *continued from page 1*

from the original version, the oscillating saw developed by Dr. Stryker is still used today as a Cast Cutter, which lets doctors remove casts easily without injuring their patients.

"Prior to the Cast Cutter, doctors had to use a chisel and hammer to pound through the hard material of the cast," Mr. Anderson said. "Dr. Stryker looked at the problem and asked, 'How can we remove a cast more quickly and, at the same time, be safe for the patient?' An oscillating saw that cut the cast material, yet did not cut the skin below the cast, was invented. That was a big advantage for patients having their casts removed, especially since many of them were young children."

Dr. Stryker began showing his inventions to orthopaedists and other medical personnel, and within a few years so many people requested products from him that in 1941 he founded the Orthopedic Frame Company. When Dr. Stryker retired from his medical practice in 1964, the company name was changed to Stryker Corporation.

A Healthy Dissatisfaction

According to Mr. Anderson, Dr. Stryker's curiosity and determination still exists in orthopaedic surgeons today.

"What we find, oftentimes, is that we'll introduce a new product and a surgeon will say, 'that instrument set you have is really good, but if

you added a curve to this particular instrument, it would be even better.' Today, products and procedures evolve with the input of surgeons because they perform surgery everyday. They ask questions such as, 'is there a way I can see better or is there a way I can make sure that the cut is smoother or faster?' They want to minimize the amount of time the patient has to be under anesthesia, while optimizing the outcome. We



Homer Stryker, M.D., founder of Stryker



The Turning Frame was one of Dr. Stryker's earliest inventions. It easily turned patients to reduce blood clots and skin problems for those confined to hospital beds for extended periods of time.

constantly receive feedback from surgeons, and it's that feedback that advances the state of the art in orthopaedic surgery."

In the past several years, Mr. Anderson said, surgeons beyond orthopaedists have found ways to apply Stryker's products.

"Medical professionals are continually looking for better ways to treat patients and to help improve lives. At Stryker we listen and then respond. It's been very interesting to see how certain technologies that were originally introduced in one area are now being used in other specialties."

Stryker's response to the continual curiosity that has driven the company since Dr. Stryker first introduced his inventions led to it becoming a \$4.9 billion company last year, nearly \$4 billion of which came from its orthopaedic products and services.

Responding to Changes

How does supporting OREF fit the company's vision? Mr. Anderson, who works with Stryker's 13 divisions to prepare annual strategic plans, says that it has to do with providing the best products and services, not only because orthopaedists want them, but also to respond to the changing lifestyles of the population.

"An increasing percentage of the population is heavier and people are putting additional strain on their bones and joints. In addition to



Patrick Anderson,
vice president
of strategy and
communications,
Stryker

that, many people are much more active than they were a generation or two ago. The combination of these two factors creates new needs in orthopaedics that did not previously exist," Mr. Anderson explained.

Beyond these concerns, an increasing number of people are living longer. The changes in society and in people's lifestyles require a response, and according to Mr. Anderson, people want to stay active and healthy as they age. By providing young physicians the opportunity to become involved in research, Mr. Anderson believes, OREF funding encourages research that leads to the discovery of fresh, new ideas.

Mr. Anderson believes that OREF can have an even broader role, with more opportunities for research in the future.

"One of the challenges is making sure that the research that is done matches the needs of the suppliers, surgeons, and patients. We must ensure that every research project is conducted to address the most important issues in our industry. That's how OREF can stay very relevant. OREF needs to be right in the middle of understanding those issues and then respond with both exceptional research and first-rate education that will positively impact the entire industry."

That idea of listening and responding is, after all, the principle on which Dr. Stryker founded the company, and on which Stryker Corporation has continued to grow. ■



Dr. Stryker's Walking Heel provided mobility for patients who had broken their legs and had to be in casts.

"Young doctors, who are at early stages in their careers, need the opportunity to conduct research and establish their reputations. OREF provides these opportunities that might not otherwise be available. This is a tremendous thing because you find younger people with new thoughts and ideas."
— Patrick Anderson, Stryker vice president of strategy and communications

"In many cases, when looking for researchers, companies think about finding a seasoned professional who has developed a reputation of being a good researcher and thought leader. Young doctors, who are at early stages in their careers, need the opportunity to conduct research and establish their reputations. OREF provides these opportunities that might not otherwise be available. This is a tremendous thing because you find younger people with new thoughts and ideas."

Mr. Anderson also said that OREF plays a vitally important role as an independent source of research and education that can provide perspective for the entire industry. "Objective research, without any preconceived ideas, is a great benefit to the orthopaedic industry."

How Strong Unrestricted Support Helps Improve Patient Care:

In the past three years, **Stryker** has provided more than \$1 million in unrestricted funding to OREF, which reflects the highest level of unrestricted corporate support from any orthopaedic company. Unrestricted funding has helped OREF to fund grants and awards for important research that has the potential to improve the specialty. Clinician scientists who were supported by unrestricted funds include:

Rex Charles Haydon, M.D., Ph.D., who received a 2003 Career Development Award for his investigation of BMP6 – Mediated Osteogenesis. **In 2004, Dr. Haydon received a K08 grant from the NIH for his work.**

Harry K.W. Kim, M.D., whose 2004 Career Development Award is allowing him to study why older children and adults have impaired healing and poor prognosis compared to younger children when they suffer ischemic injury to their hipbones.

Potential Patient Care Application of Results of this study include: **New means of stimulating healing that would improve healing for older children and adults who have suffered ischemic hip injuries.**

In the last 10 years, OREF has only been able to support about half of the grant applications that our peer review committee rated as fundable. With more unrestricted support, we could fund more important research that could advance the specialty. To make an unrestricted contribution, please see page 15 of this issue of *Impact*, or log on to www.oref.org/donate

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.

Platinum (\$200,000 & above)



Gold Level (\$100,000 - \$199,999)



Bronze Level (\$10,000 - \$49,999)

ArthroCare	Genzyme Biosurgery	Symmetry Medical
Bayer	Globus Medical	Tornier
Champion Exposition Services	Merck	SanuWave
Exactech	Ortho Biotech	Wright Medical

Copper Level (\$1,000 - \$9,999)

Aesculap	ESKA America	Orthopedic Network News
Aptic Superbones	Hapad	Pacific Research Labs/Sawbones
Arimed Orthopaedics	Innomed	PAK Manufacturing
Arthrex	Kinamed	Paragon Medical
BioMimetic Therapeutics	Knowledge Enterprises	Precimed
Blackstone Medical	Maine Orthopaedic Review Course	Scheck & Siress
Doncasters Medical Technologies	OrthoLogic	TissueLink
Encore Medical	Orthopedic Imaging Partners	Zimmer Thomson Associates

Summary of Recent Corporate Commitments



DePuy Orthopaedics — DePuy, a Johnson and Johnson Company, is providing OREF with \$75,000 per year to fund 15, \$5,000 OREF/DePuy Orthopaedic Resident Educational Grants. DePuy plans to continue this commitment for at least the next 10 years.

DePuy is also funding the **RJOS/OREF/DePuy Career Development Award in Women's Musculoskeletal Health**. The goal of this one-year, \$50,000 grant is to train and develop female orthopaedic surgeons to improve knowledge in the area of women's musculoskeletal health, and to enhance our understanding of gender and diversity differences in the outcomes of orthopaedic procedures. The candidate must be a female orthopaedic surgeon who is a member of the Ruth Jackson Orthopaedic Society (RJOS). RJOS members may contact **Mary Marino** at marino@oref.org or (847) 384-4359 for an application. Applications must be received no later than Nov. 1, 2006.

Pfizer — OREF and the American Orthopaedic Association (AOA) have collaborated on a Pain Management Initiative that is designed to determine practice patterns in orthopaedists' management of pain in patients with total joint replacement, sports, and spine related surgery. The Initiative consisted of an online survey, and an Advisory Panel. The results of both are now being analyzed, and they will be published in a final summary report this fall. It is our hope that this project will identify areas in musculoskeletal pain management that warrant additional research and education. An educational grant provided by Pfizer has made this Initiative possible.

Sanofi~Aventis — Sanofi ~Aventis has committed an educational grant to fund a Clinical Research Training Fellowship in total joint replacement including osteoarthritis, DVT prophylaxis, and other related studies. The recipient of this special fellowship will learn research study design, epidemiology and statistics, and then conduct a major research project in total joint replacement. ■

For information regarding partnership opportunities or to find out more about OREF's Corporate Associates Program, please contact **Judy Sherr**, Vice President, Corporate Relations, at (847) 384-4356 or sherr@oref.org, or **Susan Serpico**, Coordinator, Corporate Relations, at (847) 384-4355 or serpico@oref.org

Dr. Bozic: Giving Surgeons a Say in Health Policy Decisions

OREF-supported studies focused on influencing health care economics reap real rewards for hospitals, clinicians, patients, and payers

Research Summary

Kevin J. Bozic, M.D., M.B.A.

2006 Clinical Research Award recipient



Kevin J. Bozic, M.D. stands next to an X-ray of an arthritic knee before knee replacement.

Topic:

Using clinical and economic outcome data to influence U.S. health policy.

Result:

New, more descriptive ICD-9 diagnosis and procedure codes have been adopted and DRG code 209 has been split into two separate codes for primary and revision total joint surgeries.

Potential Patient Care Application of Results:

More effective public health initiatives aimed at quality care improvements and reduced revision rates. Reduced financial losses for hospitals performing substantial numbers of revision procedures, leading to greater access to care, higher quality of care, and improved clinical outcomes for patients who require revision knee and hip replacements.

Every day, public policy decisions handed down by health policy-makers affect the treatment choices that orthopaedic surgeons make. But how many clinicians have been consulted?

Since 2003, **Kevin J. Bozic, M.D., M.B.A.**, assistant professor in residence, department of orthopaedic surgery and the Institute for Health Policy Studies at the University of California, San Francisco (UCSF), has been leading an investigation of the relationship between economics, health policy, and the practice of orthopaedic surgery. The results show there is much to be gained when orthopaedic surgeons bring their knowledge and clinical experience to bear on the policy-making process.

"I wanted to create a dialogue between orthopaedic surgeons and government payers, like Medicare, regarding the costs associated with total joint replacement procedures," Dr. Bozic said. "Discrepancies between resource use and reimbursement discourage some hospitals and surgeons from doing these procedures, affecting both the quality of care delivered and patient access to care."

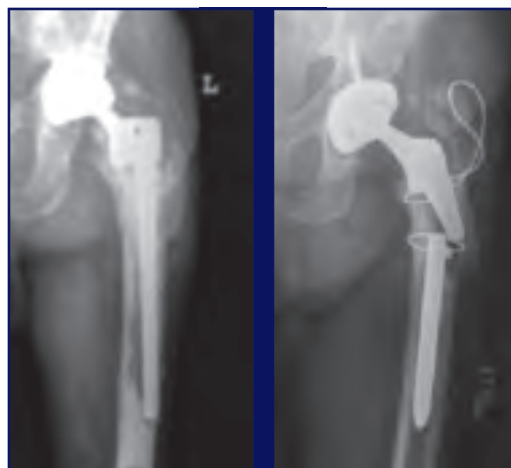
Dr. Bozic gathered detailed clinical and financial data at the patient level from three high-volume institutions: Massachusetts General, Mayo Clinic, and UCSF. An analysis of the data led to a better understanding of the actual costs associated with joint replacement procedures, the first step in opening lines of communication between orthopaedic surgeons and government payers. "This was data that Medicare and other large payers didn't have," Dr. Bozic said.

Building a case was one thing. Getting heard by the Center for Medicare and Medicaid Services (CMS) was another.

"A lot of people come to CMS with a hidden agenda. We came to them and said, 'We're interested in quality and access to care for our patients,' and they said, 'Yeah, we've heard that

story before from a lot of doctors and it always leads to some discussion about physician reimbursement.' Once they understood that we really had good intentions — and once they looked at some of the data — they were very receptive. In fact, they are starving for input from clinicians but few want to take an active role. It's easy to feel disempowered in such a large bureaucratic organization. I just continued in my very idealistic way to think that eventually they would listen to us."

In October 2004, Dr. Bozic presented data to CMS and the National Center for Healthcare Statistics at the ICD-9 Care and Coordination meeting in support of a recommendation for more descriptive ICD-9-CM diagnosis and procedure codes — codes that allow doctors and hospitals to report medical services and



Under the previous ICD-9-CM coding system, both of these failed total hip replacement procedures would have been coded the same (mechanical failure of an internal orthopaedic device). Under the revised coding system, these two cases would have distinct codes to indicate the type and cause of failure. The new codes related to revision Total Joint Replacement (TJR) will allow policy-makers and researchers to evaluate the type and cause of TJR failure using administrative claims data.



Members of the AAOS/AHKS leadership team, led by Dr. Bozic, who presented to the CMS DRG Advisory Committee in Feb. 2005. (from left): Brian S. Parsley, M.D., Baylor College of Medicine; David G. Lewallen, M.D., Mayo Clinic; Robert Fine, J.D., director, AAOS Department of Socioeconomic and State Society Affairs; Kevin J. Bozic, M.D., M.B.A., University of California, San Francisco (UCSF); William J. Maloney, M.D., Stanford University; James M. Naessens, M.P.H., Mayo Clinic; James H. Herndon, M.D., M.B.A., Harvard Medical School; William L. Healy, M.D., Lahey Clinic; and Richard F. Santore, M.D., UCSF.

procedures in uniform language that provides accurate information to government and private payers.

In February 2005, Dr. Bozic and his research team were asked to share the data with the Medicare Diagnosis-related Group (DRG) Advisory Committee, the organization within the U.S. Department of Health and Human Services that is involved in reimbursement decisions. In that meeting Dr. Bozic recommended splitting diagnosis-related group (DRG) code 209, major arthroplasty procedures of the lower extremity, into two separate codes, one for primary joint replacement procedures, and another for the more resource intensive revision joint replacement procedures. This would help accomplish a primary goal of the Medicare Inpatient Prospective Payment System,

which is to more closely match hospital reimbursement to the actual resources required to treat patients. Given the significant increase in lower extremity joint replacement procedures that has occurred in the Medicare population over the past two decades, DRG 209 is currently the largest dollar volume DRG in the Medicare system.

Much to his delight, both the ICD-9 and DRG code changes that Dr. Bozic and his team recommended were accepted and implemented by CMS in October 2005.

"I had a 5-year plan. I hoped to bring some data forward to develop a model that would be helpful in public policy-making. I had no idea that within two to three years there would be a major public policy decision made based on this work that would benefit

a significant portion of the hospitals and surgeons performing these procedures around the country. The project was successful beyond my wildest dreams."

However, much remains to be done. With support from the **OREF 2006 Career Development Award**, funded by the **Dr. Dane and Mrs. Mary Louise Miller Endowment Fund**, Dr. Bozic is pressing on.

"We are now using data from the more detailed, descriptive administrative claims codes to evaluate the resource intensity and overall cost-effectiveness of orthopaedic technologies and procedures. Our goal is to give surgeons, patients, hospitals, and policy-makers more objective data on which to base their decisions about the use of new technologies in clinical practice."

Dr. Bozic says there is an urgent need for this type of research, and the funding to make it possible.

"Health care delivery in the United States is really in a crisis. We now have far better interventions and better technology than we can afford. It's very important for the future of our profession that we understand which technologies we should be investing in, and how specific procedures influence patients' quality of life from a clinical perspective."

The alternative, Dr. Bozic says, is for orthopaedic surgeons to live by decisions made for them.

"Decisions that have a major impact on the practice of orthopaedics are often made by policy-makers behind closed doors, without input or involvement from orthopaedic surgeons. We need more research that brings relevant clinical knowledge, objective data, and hard science to inform those decisions. It's very important for the orthopaedic community, our patients, and the future of health care delivery." ■

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Marc F. Swiontkowski, M.D.

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