ANDERSON ORTHOPAEDIC RESEARCH INSTITUTE

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Sharing Findings & Expertise

For thousands of orthopaedic professionals who attend the annual meeting of the American Academy of Orthopaedic Surgeons (AAOS) each spring the conference is about keeping up with the state of their art. At this year's event doctors from the Anderson Orthopaedic Research Institute (AORI) presented research findings on a recently redesigned knee implant, treatment recommendations for knee revisions and a hip complication, and a surgical technique developed by Dr. Jerry Engh for improved knee motion. The highlights follow.

Old Versus New — And the Winner Is….

When a new type of plastic – cross-linked polyethylene — was first introduced in the late 1990s as an antidote to wear problems, the orthopaedic community placed much hope on the material. Dr. Andy Engh brought AAOS attendees up to date on the long-term performance of acetabular cup liners made with this cross-linked polyethylene. According to his study, in which he compared hip replacements done with cross-linked polyethylene to replacements done with conventional polyethylene, those hopes have been borne out.

"We found lower wear rates, less bone loss, and fewer revisions among our patients who had the crosslinked polyethylene liners. This is definitely good news," says Dr. Andy.

High-Flexion Knee Implants — Better or Not?

With new instruments and implants hitting the market every year, how do orthopaedic surgeons know whether the new products will outperform tried-and-true ones during daily activities? The research presented by Dr. Bill Hamilton at the Academy is an example of one follow-up study that is helping surgeons make informed choices about a recent knee product.

Hamilton and AORI research project manager Supatra Sritulanondha compared the outcomes of knee replacements done with a standard implant to ones done with a recent high-flexion implant. The high-flexion model was redesigned to enable patients to bend their knees further, something many surgeons have long desired. The short-term results were, however, less than hoped for.

"At one-year follow-up, we found no difference in our patient's range of motion or in the clinical outcomes between the standard implant and the newer high-flexion model," says Hamilton. "For this reason, as well as the higher cost of the high-flex design, we no longer routinely use it."

In other words, the newer design wasn't better or worse, making the best choice the tried-and-true, lower-cost standard implant.

When Knee Revisions Fail

To better understand the reasons some revised knee replacements fail a second time, Dr. Andy Engh reviewed hundreds of patient x-rays and other follow-up data from revision cases done at the Anderson Orthopaedic Clinic. Presenting his findings at the AAOS meeting, Dr. Andy said, "The main reason these revision operations failed was continued wear."

The percentage of patients requiring a second knee revision is actually low,

Dr. Andy Engh and knee project manager Nancy Parks stand next to the hundreds of patient x-rays Dr. Andy evaluated for their study on knee revisions. The results led to treatment recommendations and optimism about future knee revisions.

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Dr. Jerry Engh:
On Research & Patient Care

Though different in many ways, the Engh brothers — Dr. Charles and Dr. Jerry — have followed remarkably similar career paths and adhered to the same family-instilled philosophy of patient care. The two did their first medical rounds as young boys while visiting patients with their father, Dr. Otto Engh, at the National Hospital for Orthopaedics and Rehab in Arlington, Virginia. With Charlie always three years in the lead, they attended the same high school, college, and medical school (the University of Virginia's School of Medicine). In the early 1970s, they joined their father at the Anderson Orthopaedic Clinic. Dr. Jerry Engh reflects on the philosophies of patient care and research that shaped the Enghs' practices and the Anderson Orthopaedic Research Institute (AORI).

Q. You and Dr. Charles have carved out different specialties. Was it like that from the start?

Dr. Jerry: After Dad retired in 1974, Charlie and I took over the practice. From early on I handled the management issues, largely by default, as Charlie was heavily involved with cementless hip research and development at the time.

Charlie and I also specialized in different areas from the beginning. I was a sports medicine doc. Charlie was all about joint replacements from the get go. He did hips, knees, elbows, and shoulders through the 1970s. By the early 80s, his hip practice had grown so much that I switched from sports medicine to joint replacements and took over the knee part of the practice.

Q. What was the most important factor to the success of your early research?

All research requires good data. During our father's time, it was hard to do research. Physicians didn't collect patient outcome data in an orderly fashion, and everything tended to be anecdotal. Computers have changed everything.

When we first started collecting patient data and creating a database, we were doing something uniquely different. It started with cementless hips. Charlie was the first in the country to have data on the outcomes from cementless hip implants,

partly because it was necessary for the Food and Drug Administration approval process for making the implants available to other surgeons.

My initial research was on cementless knees, but as I looked at patient outcomes, I realized I could also study other operative and patient factors. For instance, I could review patient data to determine if draining a knee immediately following surgery was beneficial, or I could compare the effectiveness of different alignment guides used during surgery to determine how to optimally position the knee components.

Analyzing the data helped us determine which procedures and techniques produced the best results.

Q. How did the focus of your research change over time?

In the 70s and early 80s, the biggest issue with both hip and knee implants was loosening. Then Charlie and I started to note other problems on failed hips and knees. We saw that a big failure mode was implants wearing out in conjunction with osteolysis, or bone loss, that occurred around the implants due to the wear debris from the implant.

We realized we needed to focus on the many factors influencing wear. The best way was to examine failed implants retrieved from revision surgeries. Looking at the failed joint replacement, we could detect where and how much wear occurred on the implant and the location of osteolysis.

To this day, implant wear remains a major focus of our research.

Q. What are some of the questions you've asked while working to improve the performance of knee replacements?

One question is : How rapidly do malaligned implants fail? A big factor affecting knee implant wear is alignment of the implants. We have looked at different alignment guides and analyzed patient follow-up x-rays to figure out how

Thrilled with the Little Things

For years Dyan Eickholz endured knee pain so severe that she became housebound. After trying chiropractic treatments, physical therapy, shots, and acupuncture to relieve the pain from her arthritis, she realized she needed knee surgery. She had a partial knee replacement in June 2009 and a total knee replacement in April 2010. Like so many other patients, she felt compelled to write to her surgeon, Dr. Jerry Engh, to express her joy at being "given a new life." We share excerpts from her letter.

Dyan Eickholz is enjoying life's simple pleasures, like walking her dog on a sunny day with her son, Eric.

Dear Dr. Engh,

I will never be able to thank you enough for my new knees. A day doesn't go by without me thinking about how grateful I am for the knee surgeries that have given me a new life – a life I never thought was possible.

What has meant the most to me is no longer being dependent on my son, Eric. Because of the extreme pain in my knees and my inability to stand for more than a minute or two, he had to do so many things for me, things I can now do for myself.

Before the surgery, I hadn't even gone outside for three years due to the pain. Afterwards, I bought a pedometer. The first time I went outside, I was only able to walk 53 steps. The next day I walked 78. Each day I increased the steps. By August I was up to 2000 steps a day. Although I still have a ways to go to reach the recommended 10,000 steps a day, I find that just being able to walk without pain is amazing.

I could go on and on about the things we take for granted, things I hadn't been able to do for such a long time. It is a joy to simply go to a grocery store, walk the aisles, and take the groceries to my car without someone else's help. The first time I shopped alone reminded me of the feeling you get when you're little and your father lets you go to the store by yourself for the first time!

I have a white German shepherd puppy. Before the surgery it made me so sad not to be able to take him out. When I first took him for a walk after the surgery, he was a bit confused as he didn't know why *I* was walking him.

I am experiencing new joy each day. Thank you so much, Dr. Engh, for your surgical expertise in giving me a pain-free life. *Dyan Eickholz*

Dr. Jerry Engh continued

malalignment impacted the wear of implants retrieved from revision surgeries. We visually examined failed implants and then went to our database to study how alignment affected wear. It has been unique to have clinical, patient, and radiographic data to see how these factors interact to affect patient performance.

As we have taken all the data into account, we have realized that the important variables are implant design, precise surgical technique, and patient factors such as age, weight and level of activity. These are the variables that can lead to failure or to long-term success.

I tell our Fellows you need to be a friend as well as a doctor to your patients.

Q. Why was it important to you and Dr. Charles to invest in a fellowship program?

If you are concerned about the outcomes of patients, you realize the benefits of training doctors. We love training the Fellows. We look at our Fellows as our legacy to the future of joint replacement surgery. If we make them better surgeons, we multiply our ability to help patients suffering from arthritis.

Q. What is the most important lesson you want the Fellows to take with them?

I tell them you need to be a friend as well as a doctor to your patients. You can't just be a businessman. Patients want to tell you about themselves, and you're there to listen. Show interest in them first as a person, and they will trust you to be their surgeon.

Q. What are your thoughts about the future at the clinic and research institute?

Today, the young partners working in our practice are doing what Charlie and I have so much enjoyed and with the same passion. We are fortunate to have Andy, Bill, and Kevin as our legacy. I look forward to having Dr. Nitin Goyal, another hip and knee specialist, join us this fall.

Tributes to Dr. Charles Engh

What better speaks for one's medical career than accolades from patients who have been able to live free from pain and from surgeons who have used your techniques? Since announcing his retirement, Dr. Charles Engh has received many letters of congratulations and appreciation. In tribute to his dedication and achievements, we share some of the letters from patients and colleagues — with more to come in upcoming newsletters. Along with the obvious gratitude of their writers, their letters attest to the transformation of joint replacement surgeries over the last 30 years due to the research of Dr. Charles and fellow surgeon researchers of his era.

Patient Letters and Stories

My indelible memory of Dr. Charles is of a kind and brilliant doctor, who took me on against the odds and gave me back my life and with such grace and humour. *Caroline Despard*

Editor: Before being referred to Dr. Charles, Ms. Despard's hip replacement had dislocated three times. Specialists told her nothing could be done and that she should no longer live independently. "The situation was dire," she says. "I was totally crippled. My leg dislocated at the drop of a hat." In planning for her revision surgery in 2000, Dr. Charles turned to advances in computer imaging. Since that surgery, Despard has had no more hip problems, and she continues to live independently.

...thank you for the many times we have shared together in the operating room and at the office.... All the expertise you have brought to the orthopaedic community — such prestigious and rewarding efforts by one man — is amazing. You certainly deserve a good retirement filled with many happy days to come. *Carol Berg*

Editor: When Ms. Berg learned of Dr. Charles's retirement, she displayed her gratitude in a unique way. She arranged to have a flag flown from the United States Capitol in his honor. Born with dislocated hips that developed into arthritis during her teens, Ms. Berg had her first hip replacement in 1971 at age 26, before the advent of cementless implants. Those early hip replacements were short-lived. By the time she was referred to Dr. Charles in 1984, she already had endured three revisions. From 1990 through 1999, he replaced two cup liners and a cup. The success of these latter surgeries reflected advances in revision procedures and in implant materials, advances made possible by the research of Dr. Charles and other orthopaedic surgeons. We can see why she had the flag flown.

I came to see Dr. Charles for a possible second total hip revision in 2000. After reviewing my x-rays and examining me, he told me 'I think I can help you.' What a monumental understatement! Over a year's time frame (2001-2002), he corrected the problems with both of my hips. In the process he corrected my bowed legs and pigeon-toed gait and also restored an inch to my height. ... I couldn't believe the improvement. I will be eternally grateful to him and to AORI. *Paul Brown*

Editor: Mr. Brown had gone to Dr. Charles in desperation, unsure anything could be done about his hips. Both had been replaced and revised, and he feared another surgery would not be possible.

The *Joint Journal* came, and I am about to cry. But when I think of ...the great years you have given us, you deserve the time off. This year I will be 90 years old. I can still do a few things. I drive nearly every day to Cambridge, where I volunteer at the Dorchester Hospital, serve soup to nearly 500 people at church, go to the retired teachers' meetings, Women's Club, Historical Society, and my five quilting groups. I also still take care of my little boat yard on the Bay. ...Thank you for being so smart and wonderful. *Virginia Stine*, both hips replaced

At 90, Virginia Stine continues to take full advantage of her hip replacements. Here she is with one of her quilting masterpieces.

During Dr. Alexandra Claus's fellowship with AORI, she and Dr. Charles were frequently seen examining x-rays intently or hunched over a computer screen. It was hard to know which one was more passionate about the research.

Letters from Previous Fellows

From Korea

In 1994, Dr. Kyoung Ho Moon took a year away from his orthopaedic practice in Korea to learn how to do hip replacements using Dr. Charles's methods. Upon hearing of Dr. Charles's retirment, he wrote the following.

Dr. Charles spread his techniques to other countries through his international fellowship program. Here he is with Dr. Kyoung Ho Moon from Korea in 1994.

During my international fellowship, Dr. Charles lit up my life by sharing his storehouse of knowledge. Since my Fellowship, I have treated more than 4000 patients in my country and have implanted the hip stem used by Dr. Charles in more than 2000 patients. A lot of Korean patients have benefitted from Dr. Charles's consideration to me. Dr. Charles may have retired, but Engh Fellows around the world continue in his footsteps.

Kyoung Ho Moon, MD, PhD
Professor, Dept. of Orthopaedic Surgery
School of Medicine, Inha

From Germany

When Dr. Alexandra Claus, a resident in orthopaedic surgery from the University of Mannheim in Germany applied for an international research fellowship with Dr. Charles Engh 11 years ago, her timing could not have been better. Dr. Charles was turning his research focus to the problem of osteolysis, or bone loss, around hip replacements. Under his guidance, Dr. Alex, as she was known to us, jumped into these inquiries with both feet. After her fellowship, Dr. Alex continued to collaborate with Dr. Charles and AORI researchers on 10 research studies that have led to revised treatment recommendations and improved diagnostic methods for osteolysis around hip implants using CT scans. When remembering Dr. Alex's enthusiasm, it is no surprise that within 5 years of completing her residency in 2003 she became an associate professor of orthopaedics at the University of Mannheim and the head physician of an orthopaedic clinic specializing in total hip and knee replacements. Dr. Alex wrote:

I met Dr. Charles Engh for the first time in 1999, having applied for an international research fellowship at AORI. By this time, Dr. Charles Engh was an internationally-renowned orthopaedic surgeon, and I was a 30-year-old female resident in orthopaedic surgery who had learned about Dr. Charles Engh while studying the international orthopaedic literature for my doctoral thesis.

I was totally stunned and honored by the fact that the famous Dr. Charles Engh took his time to talk to me. He finished our conversation by saying, "Well, Alex, I am sure, we will have fun."

Continues Page 6

Dr. Claus's letter continued from page 5

I was deeply impressed by this dialogue, because during our short conversation, Dr. Charles made me feel like I was the center of his universe, a unique talent he always used when talking to his patients. To this day, his ability to converse with patients, to convey his caring and inspire their trust, remains my personal role model for talking to my patients and caring for them.

Of course, Dr. Charles's prediction came true — we had a lot of fun while working together on research. Our research was focused on long-term complications following total hip replacement, especially osteolysis, the bone loss occurring around a total hip replacement. We started our inquiries by evaluating patient x-rays, which was the standard way of assessing osteolysis at the time. Examining thousands of x-rays and clinical records, we evaluated the frequency of osteolytic lesions and consequences such as implant loosening and reoperations. From there, we established a model to compare the accuracy of different imaging methods for diagnosing osteolysis, including radiographs, computed tomography, and magnetic resonance imaging.

Dr. Alexandra Claus calls upon insights gained from her research fellowship with Dr. Charles when working with residents, students, and her hip and knee patients in Germany.

My work with Dr. Charles continues to give me irreplaceable insights in the understanding of the biomechanics of cementless total hip replacements. I use these insights when supervising the residents in my clinic, instructing my students at the University of Mannheim, and, most importantly, when providing information to my patients about total hip replacements in my daily practice.

Thanks to Charlie from Previous AORI Director

As Christi Terefenko mentions in the following letter, she worked with Dr. Charles at AORI for almost 10 years, both as a researcher and AORI's executive director. Those of us who worked with Christi were impressed not only by her analytical abilities, but also by her ease in managing AORI's affairs. While with us, her husband, Kevin, finished his orthopaedic residency and came aboard as an Anderson Fellow. After his one-year stint, the two returned to their home state of Pennsylvania, where they are raising their two boys and have established Kevin's orthopaedic practice in Reading. Along with managing the practice, Christi provides technical consulting to orthopaedic surgeons. As if that weren't enough, she also volunteers in numerous community activities.

THEN: As a biomedical engineer, Christi Terefenko worked closely with Dr. Charles on a research project that earned the prestigious 1996 Otto Aufranc Award Paper from the American Association of Hip and Knee Surgeons. The other authors were orthopaedic surgeons and researchers (from left): Charlie Bragdon, Murali Jasty, Bill Maloney, Tom McGovern, and Bill Harris.

I was recently asked to name the people who had the most influence in my life, making me the person I am today. I had to consider that for a while, but when I looked back I realized that one of those people was Charlie Engh. I began working with Charlie when I graduated from Johns Hopkins in 1994. Biomedical engineering graduate school had left me interested in orthopaedics, and AORI was a great fit for that. As it turned out, Charlie was a great fit for me. He was just the boss I needed to develop my research potential and propel me along my career path.

Charlie's reputation for research and teaching was well deserved. He taught me countless things about orthopaedics and clinical research. Chief among them was how to develop a good research study and how to get the studies published. Together we worked on and published over 40 research papers in peer-reviewed medical journals. Some of those studies had a great impact on patient care — for instance, identifying which total hip replacement component was better for different types of patients or identifying what caused different bone

She Walked Tall

Patient Mary Edna Cheshire left lasting memories with Dr. Jerry Engh and Patty, his wife and nurse. Upon Edna's recent passing, we found she had left even more — a legacy to the Anderson Orthopaedic Research Institute (AORI).

Mary Edna Cheshire was a petite woman who endured severe arthritis during the last 30 years of her life, yet those who knew Edna saw not a frail woman, but, rather, a strong one with great determination.

"She walked tall," recalls Patty Engh, who was Dr. Jerry Engh's nurse while Edna was his patient. "That determination is what helped her live with her arthritis."

At the age of 78 Edna had the first of five joint replacements done over a five-year period for arthritis in her knee, hip, and shoulders. In 1989 Dr. Jerry Engh performed the first of four surgeries for Edna, and that operation formed the basis of an enduring patient-doctor relationship that extended beyond the doctor's office.

"Edna was one of our patients who did well and liked coming to see us. She knew we would be happy to see her," said Dr. Jerry. "She adored Patty. She was probably more anxious to see Patty than me, as were so many of my patients."

Dr. Jerry's wife, Patty, recalls things a bit differently. "From the first time Edna came in, we just clicked, and she immediately fell in love with her Dr. Jerry. There was not going to be another doctor on the face of the earth who was going to touch her."

Edna was dedicated to finding a cure for arthritis. She was profoundly grateful after her surgery... and that enhanced her dedication to others.

"She had tremendous trust in us and what we did," says Dr. Jerry. "I think Edna felt that if she had a problem, even if it wasn't an orthopaedic problem, she could come to us, and we would be there for her."

Edna's devotion to Dr. Jerry and the Anderson Orthopaedic Clinic also stemmed from her respite from pain. Her joint replacements enabled her to return to activities such as golf and to live independently for another 18 years. That gratitude reached beyond the clinic to AORI.

"Edna was dedicated to finding a cure for arthritis. She was profoundly grateful after her surgeries. It was a new life for her, and that enhanced her dedication to others," says Patty. "At every office visit she would ask what else she could do to help AORI find a cure for arthritis."

Edna lived on her own until the age of 96, after which she resided in an extended care facility until her death at 100 years of age. True to the greatest aspiration of her latter years — helping others with arthritis — Edna left a bequest to AORI supporting our continued research into improved arthritic treatments. We at AORI cannot help but be struck by the foresight and generosity Edna displayed in this lasting gift to others with arthritis.

Thank you, Edna.

AND NOW: Christi and Kevin Terefenko, MD, with their sons, Ben (left) and Luke.

remodeling (bone growth) patterns in different patients.

He encouraged me to present our research to other surgeons at national and international orthopaedic meetings, and he had the graciousness not only to allow me to share in authorship, but also to be the lead author. Not many medical directors would have extended that to their researchers.

I thoroughly enjoyed my near 10-year experience working with Charlie both as his researcher and later as the Executive Director of AORI — although his antics often made all of us at AORI nuts. Questions of "Why aren't you at your desk?" and "Is that paper finished yet?" drove us crazy, yet at the same time they drove us forward towards success.

Since leaving AORI, I have continued to engage in orthopaedic research with surgeons around the country. Charlie is directly responsible for my success in orthopaedics and my continued passion for research. Charlie has been a wonderful teacher, mentor, and friend, and I thank him from the bottom of my heart.

Another Generation of Specialists

Every year some of the "best and the brightest" new orthopaedic surgeons come to the Anderson Orthopaedic Institute for our Joint Replacement Fellowship. Over the year, they work with Anderson Clinic physicians, learning the finer points of joint replacement procedures, gaining clinical experience, and conducting research. Meet the surgeons who joined us this year.

Dr. William J. Peace

Medical School:
University of Chicago Pritzker School of Medicine

Orthopaedic Residency:
University of California San Diego

Dr. Bryan Emmerson

Medical School:
University of California, San Diego

Orthopaedic Residency:
University of California San Diego

Dr. William Peace was most content during his residency when involved with joint surgeries. He liked it all: the evolving techniques and philosophies, the rapport with patients, the excellent patient outcomes, and the ability to advance patient care through research. Knowing he had found his field, he sought our fellowship program to further his surgical and research skills in joint reconstruction.

"The fellowship gave us the opportunity to work with cutting-edge technology. I'll be able to provide advanced care to my patients," says Peace.

Peace also worked on a hip research study with Dr. Andy Engh. The two assessed the long-term success of total hip femoral revision cases. Among these technically challenging cases, they found a success rate of 90% at an average follow-up of 15-years.

From here, Peace goes to Denver, Colorado, where he will serve joint replacement patients at Kaiser Permanente. He is excited about being able to continue doing research using the facility's national joint registry database.

When Dr. Bryan Emmerson participated in his first hip replacement surgery as a medical student, it planted the seed for his future career.

"I remember how impressed I was with the extent of disease in the femoral head and how the patient was able to walk again on the day following surgery," says Emmerson. "More importantly, I recall how elated the patient was with his pain relief."

Emmerson applied to our

AORI Research continued from page 1

according to Nancy Parks, the AORI research project manager who assisted Drs. Andy and Jerry Engh on the study.

"Only an institute with a large volume of revision cases could do a study like this. Because of the Enghs' reputations, many people are referred to the Anderson Clinic for their revisions," says Parks.

For those who do need a knee revision, the good news is that the outcomes have the potential to improve. This is due to advancements in the design of revision knee systems and the use of wear-resistant polyethylene.

The message Dr. Andy left with his colleagues at the AAOS was: "From our research we have determined that a simple plastic exchange is a better option for many patients than a full knee revision, and that for revisions surgeons should use the newer polyethylene that is resistant to oxidation."

A New Surgical Technique From A Seasoned Expert

A key element in knee replacement surgery – and one of its most challenging aspects — is the fine tuning a surgeon performs to "balance" the surrounding ligaments that provide stability to the knee.

"An implant needs to be placed so that the correct tension in the stabilizing ligaments is restored as the knee bends," says Dr. Jerry Engh.

Dr. Jared T. Roberts

Medical School: Albany Medical College, Albany, NY

Orthopaedic Residency: Albany Medical Center, Albany, NY

Dr. A. Kirk Reichard

Medical School: University of Louisville School of Medicine

Orthopaedic Residency: Indiana University, Indianapolis, IN

Fellowship with the goal of being a competent and well-rounded joint surgeon. He says he is right on track.

"During the fellowship, I was exposed to a lot of procedures I hadn't been during my residency, for instance, the different approach to hip surgery used by Dr. Bill Hamilton and the complex revisions done by Dr. Kevin Fricka."

During the first months of the fellowship, Emmerson was also involved in a major home project, the arrival of his second child. In July, he and his family will settle in his home state of California.

For Dr. Jared Roberts, a key factor in applying to our fellowship program was having worked under one of our former fellows, Dr. Frank Congiusta, during his residency at the Albany Medical Center in New York. Roberts considered Congiusta one of the best joint surgeons he had worked with, and Congiusta credited his skills to the fellowship.

In entering our program Roberts biggest aim was to further his training in revisions and complicated knee and hip deformities. By operating with our different physicians, he saw how each handles these difficult cases.

As Roberts and his wife both hail from upper New York, he has accepted a position as an orthopaedic surgeon back at the Albany Medical Center. The position provides the blend of patient care, education, and research he has desired.

Dr. Kirk Reichard took a non-traditional path to becoming a joint surgeon.

"Although my father was an orthopaedist, I did not leave for college intending to follow in his footsteps. Instead, I studied biology and pursued my dream of becoming a professional snowboarder."

When Reichard's snowboarding career was cut short by repeated injuries, he was reintroduced to orthopaedics as a patient. Finding himself interested in the field, he worked as an orthopaedic sales representative until realizing he wanted more involvement with patients. He turned to medicine and when working with joint replacement patients during his residency finally discovered his specialty.

As an Anderson Fellow, Reichard "learned how to address complicated issues involving joint replacements."

From here, Reichard joins a private group in Spokane, Washington. Still adventurous, he and his wife plan to participate in the outdoor sports around the area.

Many attempts have been made to improve the balancing process through different instruments and even robotic surgery. During the AAOS meeting, Dr. Jerry described the technique he developed to balance unicompartmental knee replacements (in which only one knee compartment is replaced). His recently developed technique, called soft-tissue-guided surgery, enables surgeons to restore the correct relationship between bone and the ligaments, or soft tissue, as the knee bends.

"In using this technique the tension in the ligaments around the knee dictates the precise amount of bone and cartilage to be removed before placing the implants," says Dr. Jerry. "The surgeon uses a spring-loaded platform that tensions the patient's capsular ligaments to guide bone cuts."

By improving implant positioning and restoring soft tissue balance, we expect a patient's knee motion to feel more natural...

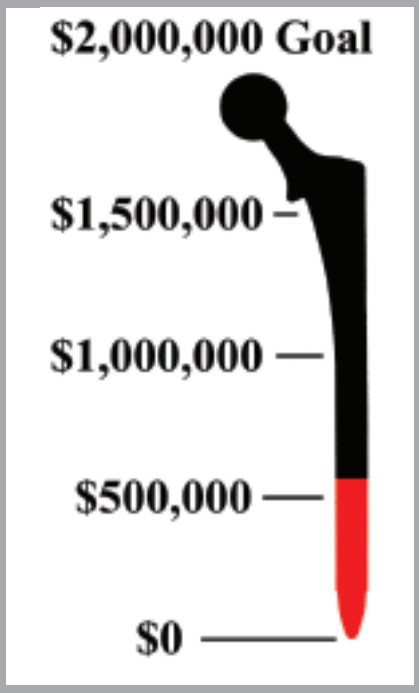
To prepare for the cuts, a set of instruments etch a groove on the surface of the femur while maintaining ligament tension as the knee is bent and extended. Then, guided by this etched groove, cutters prepare the surface of the knee joint to the correct depth.

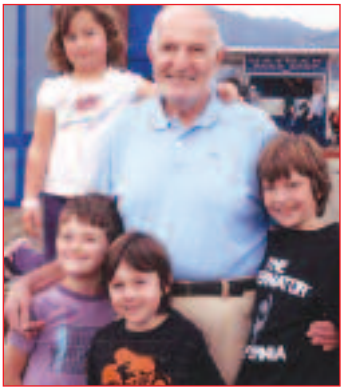
"By improving implant positioning and restoring soft tissue balance, we expect a patient's knee motion to feel more natural and the risk of implant loosening to be reduced," says Dr. Jerry.

Joint Legacy Campaign On Its Way!

In tribute to Dr. Charles Engh's contributions to joint replacement surgery, this past December the Anderson Orthopaedic Research Institute (AORI) launched the Joint Legacy Campaign For Pain-Free Movement. Our goal — $2 million in donations and estate planning commitments over the next two years — will lay the foundation for continued research towards the long-term restoration of pain-free movement for arthritis sufferers. Thanks to the generosity of donors like Edna Cheshire (page 7) and the donors listed below, we have reached the quarter mark — having received $557,001 as of March 31, 2011.

Our gratitude to AORI's supporters for helping ensure that Dr. Charles's vision for AORI continues to benefit joint replacement patients of today and tomorrow. Each donation makes a difference in helping others with debilitating hip or knee arthritis. If you have donated to AORI during this timeframe and are not listed, please contact Susan Sensi at (703) 619-4437 so we can correct our omission.





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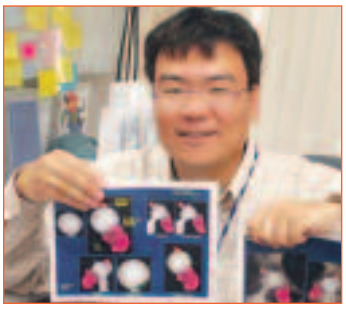

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And for helping others reach their dreams.

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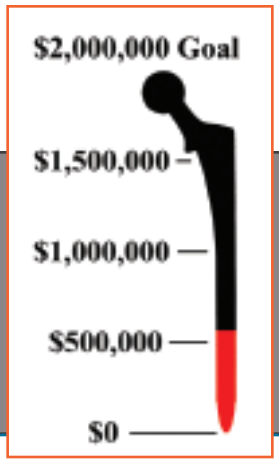
Knee Study Wins Award

This past November Dr. Bill Hamilton was awarded the 2010 Clinical Award from the American Association of Hip and Knee Surgeons as the lead investigator for AORI's study on a recent knee implant designed to give patients more knee flexion (story on page 1). In the top photo, Hamilton measures the maximum knee flexion of one of the patients in his study. While bringing his medical expertise to the research study, he relied upon research project manager Supatra Sritulanondha (bottom photo) to coordinate patient appointments, x-rays, and study forms and perform statistical analyses.



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