



Forging an Efficacious Link

By Jeffry D. Still

At Rush-Presbyterian-St Luke's Medical Center, collaboration of clinical and research personnel and resources results in exceptional teamwork and an open exchange of ideas.

While many facilities are downsizing or specializing in narrow niche markets, Rush-Presbyterian-St Luke's Medical Center in Chicago has found success by growing while specializing and linking a strong research side with a thriving clinical practice. Indicative of its success is the center's recent ranking by US News & World Report as one of the nation's top 35 medical centers for the treatment of both arthritis and orthopedic conditions.

One of Chicago's oldest health care organizations, Rush-Presbyterian-St Luke's Medical Center is the hub of the Rush System for Health, a comprehensive health care system serving approximately 2 million people. About 9 years ago, "a decision was made at Rush to focus on areas in which we were already strong, both in clinical practice and in research," recalls Gunnar Andersson, MD, PhD, professor and chairman of the Department of Orthopedic Surgery and codirector of the Rush Arthritis and Orthopedic Institute. To that end, a number of institutes were created.



Gunnar Andersson, MD, PhD, investigates biological solutions for treatment of musculoskeletal conditions.

Specialty Centers

One of these was the Rush Arthritis and Orthopedic Institute, consisting of the departments of orthopedic surgery, pathology, and biochemistry. The institute was created primarily to provide a one-stop clinical situation for patients with musculoskeletal conditions, allowing them access to surgeons, therapists, and other staff, as well as to the latest technologies. In addition, formation of the institute allowed the integration of the research efforts of Rush "such that we got the greatest possible collaboration among the clinicians, basic scientists, and representatives of various departments," Andersson says.

"It has worked well on both counts," he reports. "It has allowed us to grow our patient volumes, and our research efforts have been extremely successful in providing us with endowments, grants, and additional research bases."

Cutting-edge research is the focus of another specialty center at Rush-Presbyterian-St Luke's: the Rush Cartilage Restoration Center (RCRC). Brian J. Cole, MD, MBA, medical director of the RCRC and assistant professor of sports medicine and orthopedics, believes that Rush possesses the basic science research resources needed to solve the problems of cartilage restoration. Finding solutions is a very resource-intensive undertaking, Cole explains, requiring manpower, instrumentation, and special

equipment in the operating room. "It's often difficult in community hospitals to offer the full spectrum of solutions for treating cartilage problems."

Cole believes that there is general confusion about where various treatment options fit, how indications are evolving, and the applicability of both short- and long-term studies. Because of these concerns, he had some very specific objectives in mind when forming the RCRC. "We wanted to develop a specialty center that focuses on data collection and prospective evaluations measuring outcomes data." Another goal was to develop a database allowing patient evaluations to be interfaced with research areas for clinical and basic scientific study.

Collaborative Effort

According to Andersson, creating a highly specialized program such as the RCRC would be a difficult undertaking in any area but a medical center setting. The strong relationships that have been forged between the basic scientists and clinicians at Rush have resulted in research that is both relevant and rapidly applicable to the practice. This, in turn, helps the center's clinicians to remain on the cutting edge. Furthermore, the close clinical/research relationship has allowed the development of all types of orthopedic subspecialties at the center, including arthritis; joint replacement; cartilage transplantation; spine care; sports medicine; orthopedic cancer; foot and ankle care; hand, wrist, elbow, and shoulder care; and pediatric orthopedics.

"Traditionally," Cole says, "it has been difficult for basic scientists and clinicians to 'get in the same room' on a regular basis." Having all segments of the institute on a single site with a common mission allows for exceptional teamwork and an open exchange of ideas. "There is a high level of acceptance and enthusiasm to try to collaborate," he adds. "Right now, we're working on serum markers for osteoarthritis, allograft research, and cell-based therapy, and we have received numerous grants. These incredible resources also benefit the clinical side, where we have a relatively large patient volume and flow."

A portion of the funding for both the Rush Cartilage Restoration Center and the Rush Arthritis and Orthopedic Institute comes from a variety of research grants and endowments. As one of the premiere medical centers treating arthritis and orthopedic conditions, Rush-Presbyterian-St Luke's has received a number of prestigious grants. The World Health Organization has named Rush a Collaborating Center for the Field of Osteoarthritis, the only such center in the world. In addition, the National Institutes of Health has designated Rush the nation's only Specialized Center for Osteoarthritis Research (SCOR). The SCOR grant has been renewed repeatedly for the past 12 years, bringing almost \$1 million a year to Rush's Biochemistry Department.

Cartilage Restoration

The RCRC offers several options for the repair of damaged cartilage. Cole believes that many cartilage problems have been ineffectively treated for years, and the center is therefore working to develop and offer multiple solutions. "We've embarked on a huge effort to find the best, most cost-effective, and predictable options to treat patients," he says. Among the procedures currently offered are meniscal transplantation, arthroscopic debridement and microfracture, autologous cartilage cell implantation, and osteochondral autografts and allografts.

Over the past few years, orthopedic specialists have witnessed an explosion in articular cartilage research and a concomitant acceleration of technology. While the intense interest is promising, Cole says it can also be overwhelming and intimidating. "It is increasingly difficult to keep it all organized, both clinically and intellectually. Patients are confused about what cartilage is — they often do not know the difference between meniscus and articular cartilage. Many people with end-stage osteoarthritis are deferring joint replacement and, instead, seeking out the Holy Grail of cartilage repair in order to prevent them from having a knee replacement."

According to Cole, the RCRC is developing a centralized academic approach to this problem. Educational materials have been created, and a Web site (www.cartilagedoc.com) provides current information, studies, and postoperative rehabilitation protocols. "I also use it to help recruit patients for

clinical trials and to develop an infrastructure through which to administer these activities,” Cole adds.

Although the RCRC has existed as a formal entity for less than a year, it already receives 10 to 15 queries per week through its Web site, with patients coming from a five-state area. “We are evolving into a referral-based practice because we specialize in [cartilage restoration] objectives,” Cole explains.

Development under the umbrella of the Rush System for Health has allowed for the RCRC’s rapid growth and acceptance. Being part of such a large system — which includes numerous community hospitals and institutes, as well as Rush University (the academic component of Rush-Presbyterian-St Luke’s Medical Center) — provides opportunities “to consolidate resources, enjoy economies of scale, and take advantage of other programs that have done similar things,” Cole says. “We’re up on the learning curve more quickly.” The RCRC also benefits from the Rush System’s identity and reputation. “If people have cartilage problems,” Cole says, “we hope that they will consider consultation at the RCRC because of its academic identity and clinical reputation.”

The many services offered at Rush result in numerous opportunities for overlap and significant cost savings. “We offer a platform for educating patients about articular cartilage disease,” Cole says, “a platform to collect clinical information and to continue to collect prospective outcomes data. This allows us to reduce costs and improve upon our indications because we are centralized in one place, both operationally and clinically.”

A Model for Success

Cole is pleased with the progress and acceptance that the RCRC has enjoyed thus far. He welcomes other health care systems to use Rush as a model — providing they have the appropriate infrastructure. “I think that tertiary care centers are ripe for this type of model,” he says. “I have had inquiries from several medical centers asking for assistance in developing a similar program.” Cole points out, however, that a great deal of infrastructure and support are necessary to keep the center functioning, such as educational materials, mailings, intake forms, Web site development, the handling of incoming calls, and screenings to see if candidates are eligible. He estimates that one out of every 10 of the center’s prospective patients have high-grade arthritis, preventing these individuals from meeting the inclusion criteria for cartilage restoration.



During arthroscopic surgery of the knee, Brian J. Cole, MD, MBA, utilizes one of several options for repair of damaged cartilage.

As the RCRC has taken off, Cole has seen his practice evolve accordingly. Originally, it was a sports medicine practice focused on the knee, shoulder, and elbow. Today, because of the center’s ability to do clinical and basic science research in meniscus transplants, osteochondral autografts and allografts, measurements of serum markers for osteoarthritis, and other cell-based therapies, approximately 40% of its cases involve cartilage restoration. While Cole’s initial interest was in applying cartilage restoration techniques to the knee, he is eager to explore other possibilities. “Our goals,” he says, “are to see additional remedies for the shoulder and ankle. Other individuals in our group will be looking at the hip. The knee has been a common testing ground for a variety of treatments, and we will now move on to investigating applications in other joints.”

Although considerable orthopedic progress has been made in the past decade, there are still many patients that Cole and the RCRC cannot help. Those with end-stage osteoarthritis are often the most interested in cartilage restoration. “Many patients have been putting off an inevitable artificial joint replacement and waiting for something else to come along. They can come in and learn about what is out there now and what is likely to be out there in 5 or 10 years. They often leave the RCRC with that knowledge, saying, ‘I’m ready for my joint replacement because I don’t believe there’s anything better for me out there, either now or on the horizon.’”

“On the other hand, we have patients who have been told to live with a painful knee until they are old enough for a joint replacement. They have been told that there are no solutions — but we believe there may be. These are their finest years: they are young, healthy, and active, and enjoy playing with their kids. Other than an isolated problem in the knee, they usually have no other medical comorbidities that prevent them from being active. Unfortunately, however, the message they have received has been ‘Live with it, modify your activities, give up what you enjoy, and in time we will be able to take care of your pain — but only when you are older and we feel you are a good candidate for a knee replacement.’” The RCRC, Cole says, may offer these people solutions as well as hope for the future.

Looking Ahead

Andersson foresees exciting possibilities on the road ahead. “We are able to treat more conditions now than in the past. In the future, we will use biological methods to treat some patients, where today the only option is a surgical procedure.”

While most physicians are excited and eager to work with cutting-edge technology, Cole cautions against jumping on the bandwagon. “It is a double-edged sword: some technologies are hyped in the media before science has caught up with them, so there are discrepancies and misunderstanding.” He finds, however, that the infusion of resources available to investigate new solutions, both biological and technical, is extremely positive.

Andersson is struck by the pace of today’s technological developments, especially in musculoskeletal care. “We have seen technical developments go from research lab to clinic very rapidly. Over the next 10 years, I think we will see a lot of biological change,” he predicts, adding that scientists are just beginning to understand the factors that control the growth of musculoskeletal tissue. Some new technologies allow bone to heal faster and with greater consistency; others stimulate cartilage cells to produce more cartilage and potentially heal defects in that tissue and regenerate discs. These advances, Andersson says, will dramatically change orthopedics in the future. “That is why there is so much excitement about the next decade,” which may come to be known among orthopedic practitioners as the bone and joint decade.

Cole is confident that Rush is well positioned for the future and foresees further successes on the horizon. Orthopedic practices, Andersson adds, need to make a significant effort to keep up with technology as it is being introduced — not only for treatment options, but for diagnostic methods as well. “If they do not keep up, they will be left behind.”

That is a scenario which is not likely to happen at Rush-Presbyterian-St Luke’s Medical Center.

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