Orthopedic Research Gains a Foothold at St. Joseph's

There are several operating rooms at St. Joseph's Hospital Health Center that have a benefit that relatively few in the country have—ultraviolet (UV) lighting that appears to help prevent infection after joint replacement surgery.

There is anecdotal reporting that says UV lighting does help prevent infection, but two orthopedic surgeons at St. Joseph's, Brett Greenky, MD, and Seth Greenky, MD, are spending $250,000 of their practice's own money to prove it. And, regardless of what answers their multi-year research yields, they'll let their fellow orthopedic surgeons across the country know—one way or the other.

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—BRETT GREENKY, MD

It's invisible, but ultraviolet (UV) light bathes both the patient and surgical team performing this total joint replacement. St. Joseph's researchers are gathering data to measure how effective the UV lights are in preventing infections.

The study represents a modest example of ways in which research by physicians and others at St. Joseph's could help advance knowledge of what works—and what doesn't—in medical practice. The potential cost savings that valid, reliable studies like these might produce are significant.

As Brett Greenky, MD, puts it, the UV lighting study is a very modest effort to prove that a technology, if applied on a larger scale, could spare some recipients of hip or knee replacements from devastating infections while also saving millions of dollars in unnecessary health care costs.

As Dr. Greenky points out, hip replacement surgery has become the most reliable operation in the world with knee replacement right behind it. Statistics generated by clinical outcome studies show a 99 percent or higher success rate, and there is a 95 percent likelihood the joints will last trouble free for 10 years. The 20-year "survival" rate for the artificial joint is 90 percent or better. But watch out if infection attacks the surgical site. Dr. Greenky says the results are devastating. The patient would be very sick. There would be a need for repeat operations, lost time from work, prolonged antibiotic use, and the second replacement might not work as well. The financial cost also would be high—an estimated five times the cost of the original surgery.

"We certainly don't perceive that we are going to surpass the Mayo Clinic or the Cleveland Clinic with our research," Dr. Greenky says. "This research is focused on evidence-based medicine and improving the experience of our patients. Our focus is on clinically based research that helps us improve what is already a highly successful joint replacement program. And, we can share these important results with other surgical centers like St. Joseph's."

The potential, Dr. Greenky says, is to reduce the relatively high infection rate found in other hospitals around the country. Hip and knee replacement surgeries enjoy their nearly "slam-dunk" reputations because of efforts over the last 20 years to reduce the infection rate. Patients are now started on antibiotics before surgery. Operating rooms used for joint replacement have a higher degree of sterility supervision than other operating rooms. The environmental controls—the way the filtered air in the room is distributed—

continued on page 20

St. Joseph's Tweets Knee Replacement Surgery

St. Joseph's Hospital Health Center "tweeted," using the social media application Twitter, to help educate the public about orthopedic surgery in May. Orthopedic surgeons, Seth Greenky, MD, and Brett Greenky, MD, performed a knee replacement procedure on a 63-year-old woman, who was pleased to allow her procedure to be shared with others.

St. Joseph's has a strong social media presence, including sites on YouTube, Facebook, LinkedIn and Twitter. To follow the hospital on any or all of these sites, click on www.sjhsyr.org/socialmedia.

continued from page 19

also help lower infection rates. Some hospitals like St. Joseph's encase doctors and nurses in lightweight body suits and helmets to further reduce the spread of bacteria carried on skin and hair cells that are constantly shed by all of us—surgeons and nurses included. The latest advance has been the addition of ultraviolet ambient lighting that kills even more bacteria hitchhiking on dust particles and other surfaces.

"The literature about the germ-killing ability of UV has been around for years," Dr. Greenky says. "There is evidence that it works, but the data we are gathering will add to the body of evidence, one way or the other."

The national average for infection in hip and knee replacements is already low, at about 2 percent, Dr. Greenky says. Although, he adds, institutions doing a really good job of infection control should have a rate, like St. Joseph's, of considerably less than 1 percent. With infection rates already so low, it will take a large (more than 6,000) sample of patients to gain meaningful statistical data about whether or not UV light really works to reduce surgical site infection.

St. Joseph's and Syracuse Orthopedic Specialists (SOS), Dr. Greenky's practice group, perform between 1,200 and 1,300 joint replacement procedures each year. The data already exist on 3,068 replacement patients who were operated on in rooms without UV lighting. Data on those whose joints were replaced under UV light (installed on March 30, 2009) is being gathered now, but there will be a lag because a patient cannot be considered "infection free" unless there has been no infection within a year after the surgery. In procedures in which an artificial joint is not implanted, patients are considered "infection free" after only 30 days.

Much of the research project is being funded by SOS, and the costs are primarily to pay the salaries for two full-time and a single half-time employee over the life of the research.

"For years we have refined our process based on the findings of other people's research," Kim Murray, RN, MS, CNOR, St. Joseph's director of surgical services, says. "That's why this program is so great. This is really the first initiative to do our own primary research, and it's really a huge commitment mainly due to the labor intensive information gathering, medical record review and data transmission."

Anything that is considered human research must be approved by St. Joseph's own investigational review board that is under the watchful eye of the Food and Drug Administration. It's heavily regulated.

"The ultraviolet light industry is *not* paying for this research," Dr. Greenky says with a smile. "The $250,000 is part of our contribution to the community, aimed at doing what we do best for our patients and then making it even better."

The UV light study is well underway, and there are other research projects under consideration, Dr. Greenky says. Funding of up to $400,000 is being sought now to determine the effectiveness of a combination of common painkillers used in joint replacements that are delivered by an alternate route directly to the surgical site where they are most needed. The use of this device (described by Dr. Greenky as being like a "soaker hose" used in local gardens) is believed to decrease the need for narcotic drugs during recovery, decrease the patient's perception of pain, and possibly decrease the length of a patient's hospital stay. The study focuses on optimizing the combination or type of medication delivered directly to the surgical site. The research would be what's known in medical research circles as a prospective, randomized, double-blinded, placebo-controlled study. That essentially means that no one knows which patients are being treated with which combination of drugs until research coordinators begin the data analysis phase.

"The thing that makes St. Joseph's orthopedic program so ripe for formalized research is that we have a large number of patients having procedures performed by a small number of providers who are using almost identical procedures," Dr. Greenky says. "That's unusual, and it is very much the right base for research studies."