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BECKER'S

ORTHOPEDIC, SPINE & PAIN MANAGEMENT

REVIEW

Jan./Feb. 2012 • Vol. 2012 No. 1 Business and Legal Issues for Orthopedics, Spine and Pain Management

125 Outstanding Knee Surgeons

By Laura Miller

The following knee surgeons were selected based on awards they received from major organizations in the field, leadership in those organizations, work on professional publications and positions of services at hospitals and practices. The surgeons are listed in alphabetical order by last name. All physicians who are placed on the list undergo substantial review from our editorial staff and industry leaders. Physicians do not pay and cannot pay to be selected as an outstanding physician. This list is not an endorsement of any individual's or organization's clinical abilities.

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101 Hospitals With Great Spine & Neurosurgery Programs

By Bob Herman

The hospitals selected for inclusion on this list underwent substantial editorial review and were chosen based on clinical accolades, quality care and contributions to the fields of orthopedic spine and neurosurgery. These hospitals have been recognized for excellence in spine and neurosurgery by multiple healthcare rating sources and many are on the forefront of clinical research and development. Inclusion on this list is not an endorsement for the clinical care of selected hospitals or associated providers. Hospitals do not pay and cannot pay for inclusion on this list. The list is arranged in alphabetical order.

Arizona Spine & Joint Hospital (Mesa, Ariz.). Arizona Spine & Joint Hospital is a physician-owned facility known for its progressive approaches to spine and other orthopedic surgeries.

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Highest and Lowest Compensated Orthopedists: 5 Things to Know

By Laura Miller

Some orthopedic subspecialists experienced an increase in compensation while others decreased significantly. Spine surgeons are still the highest compensated subspecialists, but now joint surgeons join them at the top. Here are five points on orthopedic and spine surgeon compensation from MGMA's *Physician Compensation and Production Survey: 2011 Report Based on 2010 Data*.

1. Spine surgeons and joint specialists were the highest compensated in 2010. Unlike in 2009, when spine and sports medicine physicians earned the top spots as the highest compensated orthopedic subspecialties, spine and joint replacement surgeons received the honor in 2010. Spine surgeons received \$760,782, which was about \$50,000 higher than the previous year's average, and more than \$85,000 greater than joint specialists, who received

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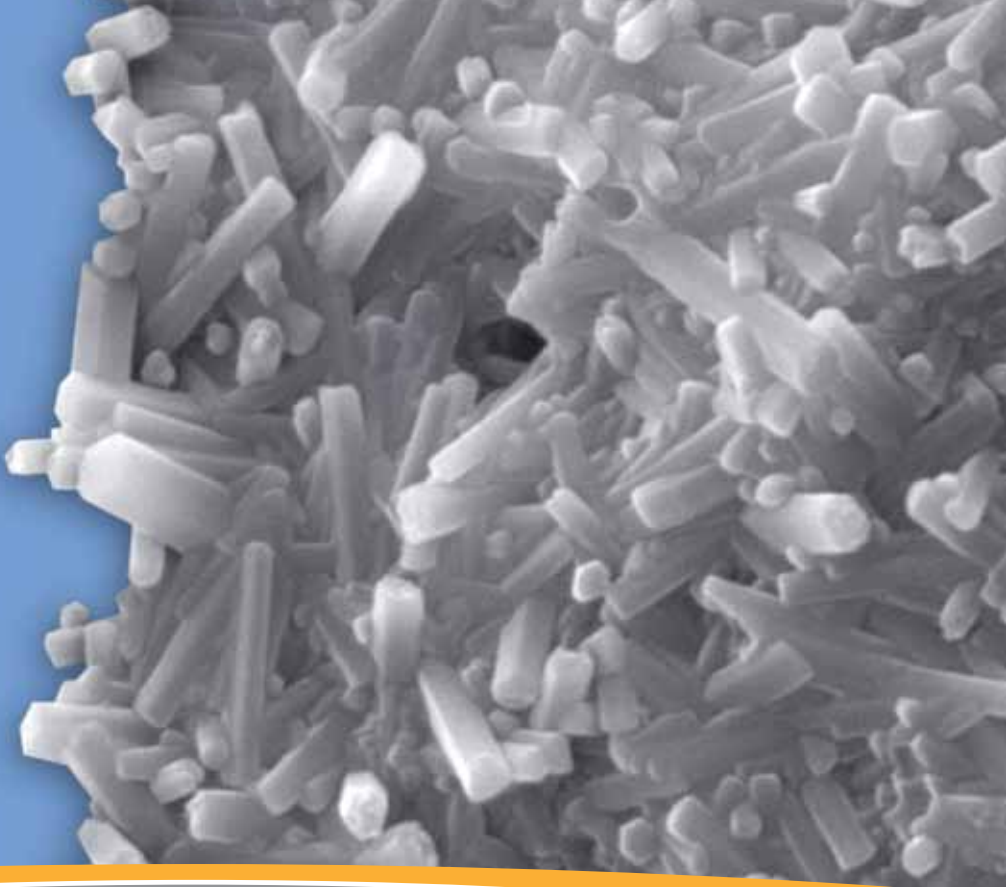
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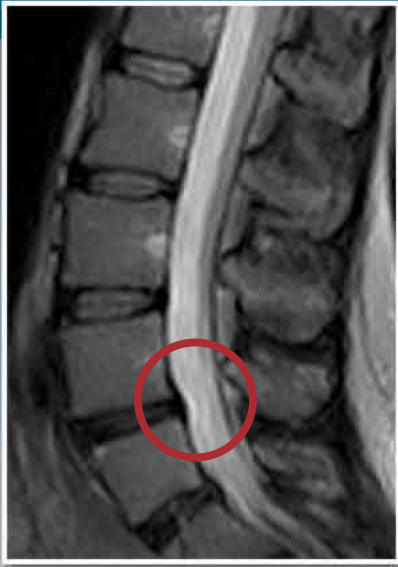
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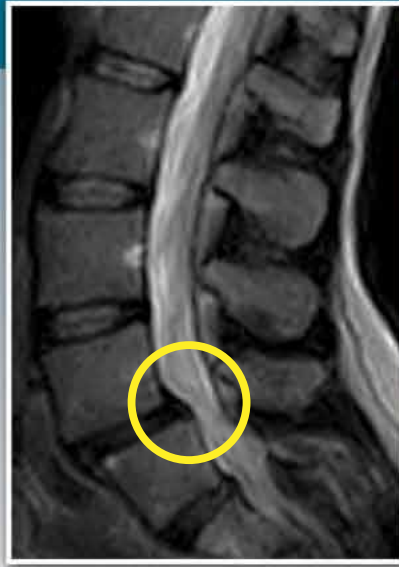


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Publisher's Letter

5 Core Concepts for Healthcare Providers This Year; 2012 Becker's Orthopedic, Spine & Pain Management-Driven ASC Conference— June 14-16, Chicago

Here are five core concepts for healthcare providers this year, as well as observations on key healthcare delivery trends during 2011.

1. Substantial shifting of healthcare providers. 2011 was an absolutely fascinating year in terms of pieces moving around the healthcare map. We saw an uptick in the amount of acquisitions by hospitals of hospitals and practices. Irving Levin and Associates reported that the top 10 hospitals mergers were valued at \$5.6 billion in 2011, up from \$3.8 billion in 2010. A recent Price Waterhouse Health Research Institute survey reported 46 percent of physicians are interested in hospital employment. This type of interest is consistent with the number of practice transactions we are seeing.

2. Assessing acquisitions, independence. We expect that in 2012 parties will be spending a good deal of time digesting the acquisitions they made last year and making sure that they have met their expectations. We expect independent hospitals and independent practices to take a deep breath and really assess their situation before aggressively moving forward to give up their independence.

3. ASC transactions, out-of-network, going public and more. The surgery center industry also saw a number of transactions involving national companies and hospitals buy-

ing surgery centers. We also saw (1) big chains pursue wholly the model whereby they partner with hospitals to acquire centers, (2) a return of big chains buying centers without hospital partners and (3) a couple large chains showing continued interest in acquiring physician-owned hospitals. In this sector, we also continue to see more and more aggressive action by payors as to out-of-network patients and increased effort to scramble for independent physicians to fill slots in surgery centers. We expect a few large ASC chains to test the public markets in 2012.

4. Increased governmental investigations. In 2011, we also witnessed significant increases in governmental investigation on a whole variety of fronts, including physician hospital relationships, false claims and billing and coding claims. With more integration of both providers and of payors, we expect more antitrust claims as well. Further, with more healthcare fraud investigators on the street, there will most likely be increases in anti-kickback and Stark Act investigations. RACs will also have an increasing material impact on hospital net income.

5. 2012 Developments. We expect 2012 to be a very interesting year. There will be (1) a Supreme Court decision on the Patient Protection and Af-

fordable Care Act's constitutionality, (2) a presidential election and (3) a great deal of overall uncertainty in the markets as to the direction of the country, and as to the direction of the healthcare sector.

6. 10th Annual Orthopedic, Spine & Pain Management-Driven ASC Conference.

On June 14-16, the 10th Annual Orthopedic, Spine and Pain Management-Driven ASC meeting will be held in Chicago. The meeting will include outstanding breakout sessions and keynote speakers Sam Donaldson, Tucker Carlson and Lou Holtz. We hope you will join us in Chicago for the event.

Should you have any questions or if we can be of help in any manner, please do not hesitate to contact me at sbecker@beckershealthcare.com or call me at (800) 417-2035.

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Scott Becker

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10 Tips for Orthopedic Practices to Remain Independent

By Laura Miller

It's much more difficult for orthopedic practices to remain independent today than it was even five years ago. As more and more practices are selling to hospitals and specialists are becoming employed, some independent groups are struggling to stay afloat. However, there are some large groups, such as OA-Centers for Orthopaedics based in Portland, Maine, which have been able to remain independent and even grown over the past few years.

"There's no doubt that it's becoming more and more difficult to stay independent," says John Wipfler, CEO of OA-Centers for Orthopaedics. "Eight years ago, in Maine, about 35 percent of physicians were employed by a hospital or system. Today, that number is more than 70 percent, and in northern Maine it's really hard to find independent physicians. We've been lucky to maintain our independence and open three new offices in four years."

Mr. Wipfler discusses some fundamental things an orthopedic group needs for success in today's ever-changing healthcare environment.

Basic fundamentals

Having a strong basis in the fundamentals is an important first step in securing your group's independence. Here are the elements that make up the foundation of a strong orthopedic group.

1. Clinical outcomes and patient experience. Orthopedic groups must have outstanding clinical outcomes to build a reputation of excellence within their community. "Part of the reason for our success is that we have a long history in our community and a reputation of being an outstanding orthopedic practice in terms of our outcomes and how we treat our patients," says Mr. Wipfler. "It has become foundational: if you sell a crappy car and the car industry environment is bad, you won't survive."

In addition to focusing on good clinical outcomes, orthopedic groups should have a strong foundation of quality service. Constantly consider how the practice can give patients a better value in terms of respecting their time and making sure they are treated well during their time at the practice. One of the ways OA has been able to meet the needs of their patients is by building additional satellite offices closer to patients who would have traveled longer distances to see subspecialists at the central office.

2. Low staff turnover, high engagement.

As a way to support patient satisfaction and manage expenses, orthopedic groups should also be focused on keeping their staff happy. "Practices

have to remember that their most valuable resources are their staff and they have to work really hard to keep their staff happy," says Mr. Wipfler. "The average medical practice turnover rate is 18-19 percent and we are somewhere around 9 percent — half of the national average."

It's important to keep good staff members who know how to treat patients consistent with your group's patient-centered culture and can quickly answer any questions patients might have about their care. Training new staff members takes a great deal of time and money, and if they leave the practice quickly they are a drain on resources.

"If you want to retain experienced and good people, it makes sense to put resources into keeping them happy," says Mr. Wipfler. "Pay is only the beginning and it doesn't need to be at the top of the scale. Respecting their wisdom, giving them a voice in the practice, having working committees with staff and creating many channels for hearing about what they are thinking and feeling. We want to keep morale up and be very transparent about what is happening in the practice. Enlist them in helping you solve your problems."

3. Be upfront with staff about tough issues. A big factor in employee satisfaction is respecting how the group deals with changes. For example, OA had to freeze employee wages in 2009 because the practice was expecting lower revenue than in previous years. "When changes are coming, we want to give employees a heads up so that when the hard issues arise, there aren't any surprises, which builds trust," says Mr. Wipfler. "We are honest in telling them why we have to make a change and work with them to find the best solution to the problem. We often solicit their input and help."

In this case, practice management asked the staff to help find cost-saving measures and in turn allowed the staff to benefit from cost savings. The incentive program encouraged employees to work harder at lowering costs and minimizing waste, which made the practice more successful. "With this solution, we treated our employees respectfully and decently, and we were able to come through a challenging time," he says. In the end they did better that year financially than in other years.

4. Provide ancillaries with continuity of care.

It's very helpful for orthopedic practices to add ancillary services, if they haven't already, and fully integrate all services to provide the best continuum of care possible. OA includes fully integrated X-ray, MRI and physical therapy services and a surgery center in addition to its clinic, so pa-

tients can benefit from several specialists who are all in communication about their individual care.

"The patients understand that their care is communicated from point to point, and they appreciate it," says Mr. Wipfler. "Ancillaries are a big part of our ability to survive over time, in part because it is more cost efficient as well as improves quality of care as a result of the continuity of care by providers who are all on the same page."

Positive mindset

When a practice has sound fundamentals, the leaders can begin focusing on different tactics for adapting and surviving within the volatile healthcare world. "We are in a healthcare environment that is very chaotic," says Mr. Wipfler. "There is a lot of change going on and if you don't have the fundamentals in place, it's hard to survive, not to mention thrive. If you do have the fundamentals intact, your mindset amid the upheaval in the healthcare industry is critical."

5. Find the opportunity for success. In Mr. Wipfler's view, the disorganization and crisis of the current healthcare system can be an opportunity for his group to grow and develop. "In a stable environment where everyone's turf is secure, it's hard to upset the apple cart and create better opportunities for your group," he says. "When things are up in the air, you can find opportunities you might not have had before if you are looking for them and don't react to the uncertainty with fear." Approach your challenges with an open mind and a great deal of curiosity. That posture will help you see opportunities.

6. Don't react with fear. When you are merely reacting to the fear of uncertainty, you will miss potential opportunities for taking advantage of a tumultuous time. Instead of fearing potential changes, orthopedic practices should identify their competitive advantages, especially over hospitals, and find ways to exploit them. "It's hard for large hospital organizations to feel friendly to patients, like a smaller practice does, which is a competitive advantage we could exploit," says Mr. Wipfler. "Large hospital organizations can also be clunky, and one of the things we can do is create a high level of customer service that hospitals find hard to compete with."

Another point that Mr. Wipfler often highlights is the group's ability to spread throughout the community while the hospital is fairly grounded within the walls of a single facility. "A hospital is locked where it is, but we are able to have satellite offices in a number of areas," he says. "Local hospitals can't as easily build somewhere else, but we can be nimble and create facilities that are closer to our patients."

7. There will be hard decisions, lean in.

With all the challenges being faced by practices there will be hard decisions. OA had its trauma specialists and a number of its joint replacement surgeons recently leave to join a hospital. “It was a very difficult event for the practice and not of our choosing,” says Mr. Wipfler. “However, one of the most important tasks of leadership in any organization is to understand the change process and take front and center through the inevitable minefields of big events — lean in, don’t shy away.”

If you are thoughtful, open and enlist everyone for the challenge not only will you increase the likelihood of making it through, but you may come out on the other side better off.

8. Share ideas with other specialists.

Just because your orthopedic group may be one of the only independent orthopedic groups in the community doesn’t mean you’re alone in your struggles. There are most likely other independent orthopedic groups or other specialty groups in the state that are facing the same challenges you are, and sharing information amongst specialists can help each group grow stronger. The physicians and leaders at OA have been instrumental in forming an IPA in Maine for specialty practices only to support one another.

“We’ve been involved in the founding of a specialty-only IPA where we come together with other specialists to share resources and ideas, and we collaborate to help each other reduce our expenses and find other opportunities to thrive,” says Mr. Wipfler.

9. Show employers your value.

The need for quality care at a reduced cost has caused employers to become focused about where employees are receiving care and how much it costs. They want to ensure their employees have the best care for the lowest cost, and they are less restrained than they used to be about identifying their provider preferences.

“We are seeing some big employers who are self insured looking for high value, meaning high quality for their employees, but at a reasonable cost,” says Mr. Wipfler. “These employers are thinking of steering patients to specific providers who meet these qualifications. If we give them a break on our fees and maintain or improve quality, they will change their plan so it costs employees less to come see us in co-pays and deductibles. If you are in a position to take advantage of that, I think its something practices can do to provide great value.”

10. Have strong leadership. A strong leadership team that is able to spend time working on issues within the practice and dealing with the outside world is helpful to sustained success. The management team needs to focus, with physician owners, on successful strategies and their implementation. “The most important thing for physicians to be doing is the thing they are trained for: orthopedic care and surgery, however, as owners they need to be engaged in the practice issues,” says Mr. Wipfler. “Our management team and physician owners are working toward a good, strong relationship and good internal coordination so everyone is on the same page.”

In some larger groups, it can be difficult to bring every physician on to the same page, especially if the group has subspecialists. Surgeons in different subspecialties often have different goals or points of focus, and the management team needs to work with the various groups of physicians to find a common solution. “We have an executive committee and a board, as well as different committees and groups that meet to talk through issues,” he says. “You’ve got to be talking all the time because there are going to be some differences, but focusing on your overarching goal will ensure the smaller decisions and differences don’t derail the practice.” ■

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Highest and Lowest Compensated Orthopedists: 5 Things to Know (continued from page 1)

\$675,156 as the second highest compensated subspecialty.

2. Sports medicine and foot and ankle surgeons experienced a compensation decrease. While sports medicine surgeons were among the highest two compensated orthopedic subspecialties in 2009, they experienced a compensation decrease in 2010, which left them in third place receiving \$645,602, an \$8,000 decrease from 2009. Foot and ankle surgeons experienced a much more drastic decrease in compensation from \$518,463 in 2009 to \$493,545 in 2010.

3. Orthopedists almost always fared better in a single-specialty setting. In almost all subspecialties, orthopedic surgeons who practiced in a single-specialty setting were compensated higher than their counterparts in multispecialty practices. The only exception to this rule was orthopedic spine surgeons, who earned \$729,917 in a multi-specialty practice as opposed to \$627,340 in a single-specialty practice. The spine surgeons in multi-specialty practices were the highest-compensated of all orthopedic subspecialists in both single- and multi-specialty practices.

4. Most orthopedists earned more in the Midwest and South. General orthopedic surgeons, lower and upper extremity specialists and spine surgeons were more highly compensated in the Midwest than anywhere else in the country. Joint surgeons and sports medicine physicians were more highly compensated in the South than in the other regions. The highest compensated orthopedic surgeons were spine surgeons in the Midwest, who received \$777,988 in 2010, while the lowest compensated were foot and ankle surgeons in the West who received \$423,023.

5. Men still outpace women in compensation. Among general orthopedic surgeons, men received \$63,386 more on average than their female counterparts. Data was unavailable for female orthopedic surgeons in most subspecialties. However it was available among hand and sports medicine physicians. While female general orthopedists showed the smallest gap, sports medicine physicians weren't far behind. Female sports medicine physicians received \$313,623, compared with their male counterparts who received \$382,845, which is a \$69,222 difference. Female hand surgeons had a much bigger gap, receiving \$158,350 less than men. ■

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5 Principles of Rothman Institute's Innovative Orthopedic Practice Business Model

By Laura Miller

Rothman Institute, based in Philadelphia, is a large multispecialty orthopedic group that added its 15th office location earlier this year, increasing its number of physician partners close to 80. The practice's success can be attributed in part to its innovative business model, instituted 15 years ago by the original seven physician partners.

"When we began the practice in 1996, we were making no money and wondering whether one of us should go and get an MBA," says Alexander Vaccaro, MD, PhD, a spine surgeon and one of the founding partners of Rothman Institute. "In reality, all we needed was practical application of basic business principles. We wanted to run our practice like a private company, which meant getting good help from an outside person — our CEO Mike West. He came in and his job was to educate us on business tenants. He sat down with us and talked about everything we needed to know about our business."

Dr. Vaccaro discusses five basic principles of Rothman's successful business model and how they can be applied to physician practices around the country.

1. Differentiate the practice. Success for your business in a competitive market depends upon differentiating your product from others on the shelf. The same rings true for orthopedic practices. When launching their practice, the original Rothman partners were keenly aware of this concept. "In order to be a sustained leader in our market, we had to differentiate ourselves," says Dr. Vaccaro. "Instead of just being the best surgeons clinically, we had three additional criteria our partners strove to meet: we had to be clinically productive, a good citizen and active in academic work."

Maintaining clinical productivity meant the surgeons were seeing an appropriate patient volume and optimizing their time; being a good citizen meant respecting all employees, being a team player and contributing to the positive culture at the practice; having a focus on academics meant the surgeons were also required to research and write papers, deliver lectures at professional meetings and participate in community events such as sitting on the sidelines at youth sporting activities.

"You can't just be a productive orthopedic surgeon because everyone does that, and their practices can still fail," says Dr. Vaccaro. "If you give

back to the community and participate academically, that's different."

2. Work together on problem solving and business opportunities. Rothman Institute has monthly board meetings allowing leaders from each service line to gather and discuss the challenges and opportunities in practice management. Board members take time to review different issues and crises as well as highlight good things happening within the practice and work on ways to manage problems. The board meetings also serve as a forum to discuss new business opportunities.

"We are plastic," says Dr. Vaccaro. "We mold our practice to the healthcare environment. Although none of us has a formal business background, our CEO teaches us and keeps us abreast of changing regulations and healthcare legislation."

Twice per week, Mr. West sends the surgeons e-mails with different business articles and news items so they stay abreast of the situation. Right now, the partners are working with HealthGrades to optimize efficiency and patient satisfaction.

3. Enter into strategic partnerships with potential competitors. After forming their practice, leaders at Rothman Institute quickly began searching for ancillary income opportunities. The group supplied physical therapy, imaging services and opened a surgery center before founding a specialty orthopedic hospital. With each venture, the surgeons at Rothman Institute forged valuable partnerships with other medical professionals.

"We didn't compete with hospitals or other orthopedic groups; we partnered with them," says Dr. Vaccaro. "All business deals we made were good for both entities. Over time, as reimbursement went down, our income went up. We became more efficient because we controlled our surgery center, and the center fees went back to the physicians. With the specialty hospital, the profits went back into the hospital and the surgeons."

4. Show no favoritism. Part of the transition away from traditional management models involved abandoning the "seniority rules" tenant that gave favoritism toward older, senior partners. "We didn't want any favoritism in our



group," says Dr. Vaccaro. "That paradigm has failed over and over again in medical models today." Instead, the partners decided to give every surgeon the same expectations and incentivize surgeons to meet their goals with bonuses doled out on an even plane.

"We have a large number of orthopedic surgeons, which means we have to have a transparent business model," says Dr. Vaccaro. "Everyone is treated the same in the group and paid in the same way. Every month, financial statements are given out to the partners so they can see the numbers for all other partners."

The data given to each partner includes patient volume, expenses and overhead costs associated with each partner. The transparency can motivate surgeons to improve their numbers and spark discussions among surgeons about different strategies more successful surgeons use to optimize their results.

5. Expand into new markets strategically. Opening new office locations can provide a great opportunity to serve patients in a new market and create more revenue for your practice. However, you have to make sure the new market location can support your office. Practices can test the waters by meeting with hospital administrators and potentially forming a partnership, such as a co-management arrangement.

"Nowadays, you are seeing a growing trend of physicians becoming employed by hospitals," says Dr. Vaccaro. "That hasn't happened with our group. When we are looking to expand to a new location, we look at the area of orthopedic care and ask what would work well with the hospital. If the area is well served, we don't have an opportunity. If the area needs more orthopedic service, we go to the hospital and see how we can work with them." ■

5 Points on Orthopedic Surgeon Compensation and Expenses

By Laura Miller

Here are five points about orthopedic surgeon compensation in different practice settings based on statistics from the Medscape Physician Compensation Report 2011.

1. Orthopedic surgeons in small cities earned the most. The population of the city where orthopedic surgeons were working had a significant impact on compensation level. Orthopedic surgeons practicing in small cities earned nearly \$450,000 on average, and those in areas considered rural or small towns stood to earn at least \$400,000. This is about \$80,000-\$150,000 more than surgeons practicing in the suburbs (\$300,000) and in metropolitan areas (\$321,000).

The report authors suggest that orthopedic surgeons practicing in small towns and cities might be more likely to consolidate into group practices, healthcare organizations or choose hospital employment, which yields higher annual salaries than solo practitioners.

2. Hospital-employed orthopedic surgeons reported higher compensation. Orthopedic surgeons who were employed by hospitals reported the highest compensation, at more than \$400,000 on average, with physicians who were in a single specialty group following close behind. Physicians who were partners in a private practice or members of a multispecialty group reported between \$350,000 and \$400,000 while solo practitioners reported an average of around \$300,000 over the same period.

According to the analysis, physicians working in a single or multispecialty group was compensated on average less than 10 percent lower than those employed by hospitals. There was a \$275,000 difference between orthopedic surgeons employed by the hospital and the lowest compensated group: private practice employee physicians.

3. More hospital employees than private practice physicians feel fairly compensated. Approximately 47 percent of orthopedic surgeon respondents reported feeling fairly compensated, and only 55 percent of physicians across the board felt their compensation was fair. More orthopedic surgeons in employment situations (56 percent) reported feeling fairly compensated than orthopedic surgeons in a practice setting (39 percent).

4. Most orthopedic surgeons in private practice didn't reduce office costs. In 2010, nearly 70 percent of the private practice orthopedic surgeon respondents reported the inability to reduce office operating costs. Around 23 percent of respondents reported reducing costs by less than 10 percent and only about 7 percent reported decreasing costs by more than 10 percent. According to the report authors, concerns about the rising expenses were only second to concerns about Medicare and insurance reimbursement levels among orthopedic surgeons. The increased office expenses can be attributed to the high number of orthopedic surgeons investing in procedural equipment.

5. Nearly one-third of orthopedic surgeons have already or plan on investing in healthcare real estate. Around 28 percent of orthopedic surgeons reported investing in a surgery or clinical procedure center and another 3 percent more plan on investing in the future, according to the report. Investing in healthcare real estate can increase the physician's total compensation if the venture is successful. On the other hand, investing in healthcare real estate requires a significant upfront financial commitment and the uncertain healthcare environment could mean a decrease in these types of ventures in the future. ■

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125 Outstanding Knee Surgeons (continued from page 1)

Answorth A. Allen, MD (Hospital for Special Surgery, New York City). Dr. Allen serves as medical director for the NBA Player's Association and team physician for the New York Knicks. Dr. Allen focuses his clinical practice on arthroscopy, knee reconstruction and sports medicine care. His current clinical trials include examining revision ACL reconstruction in adolescents.

William C. Allen, MD (University of Missouri School of Medicine, Columbia). Dr. Allen is a past president of the American Orthopaedic Society for Sports Medicine and Mid-American Orthopaedic Association. He also conducts research focused on bioabsorbable materials, intra-articular meniscal suture devices and the biomechanics of the musculoskeletal system.

Ned Amendola, MD (University of Iowa Hospitals & Clinics, Iowa City). Dr. Amendola is the director of the University of Iowa Sports Medicine Center in Iowa City. His current research projects include a randomized trial of bioabsorbable arrows versus sutures for meniscal suturing and limb alignment following high tibial osteotomy.

James Andrews, MD (Andrews Institute for Orthopaedics & Sports Medicine, Gulf Breeze, Fla.). Dr. Andrews founded the Andrews Institute for Orthopaedic & Sports Medicine and has served as president of the American Orthopaedic Society for Sports Medicine. He has also served on the board of directors for the Arthroscopy Association of North America and International Knee Society.

Michelle Andrews, MD (Cincinnati Sports-medicine and Orthopaedic Center). Dr. Andrews has a professional interest in sports medicine and knee and shoulder surgery. She was the first female team physician for a major league baseball team, the Baltimore Orioles, and also served as a team physician for Johns Hopkins athletics.

Richard Angelo, MD (Joint Life Orthopedics & Sports Medicine, Kirkwood, Wash.). Dr. Angelo is currently the president of the Arthroscopy Association of North America and is a surgeon with Joint Life Orthopedics & Sports Medicine. He focuses on arthroscopic reconstructive and minimally invasive surgical techniques for knee and shoulder surgery.

Robert A. Arciero, MD (University of Connecticut Health Center, Farmington, Conn.). Dr. Arciero is the chief of the sports medicine division in the department of orthopedic surgery at the University of Connecticut Health Center. He also serves as the director of the orthopedic sports medicine fellowship pro-

gram at the UConn Health Center and orthopedic surgeon for USA Hockey.

Frederick M. Azar, MD (Campbell Clinic Orthopaedics, Memphis). Dr. Azar is the chief of staff at Campbell Clinic Orthopaedics and team physician for the Memphis Grizzlies. His additional responsibilities include sports medicine fellowship director at UT-Campbell Clinic and editorial board member of the *American Journal of Sports Medicine*.

Bernard R. Bach, Jr., MD (Midwest Orthopaedics at Rush, Chicago). Dr. Bach is the director of sports medicine at Rush, a position he has held for more than 20 years. He has served as president of the Herodicus Society and American Orthopaedic Society for Sports Medicine, and has been team orthopedist for the Chicago White Sox and Chicago Bulls.

Robert Barrack, MD (Barnes-Jewish Hospital, St. Louis). Dr. Barrack is the chief of staff of the orthopedics department and chief of adult reconstructive surgery at Barnes-Jewish Hospital in St. Louis. He serves as the treasurer for The Knee Society, which has recognized his research in basic science and surgical technique.

Daniel Berry, MD (Mayo Clinic, Rochester, Minn.). Dr. Berry is the chair of orthopedic surgery at Mayo Clinic. He is currently the president of the American Academy of Orthopaedic Surgeons and previously served as president of the American Association of Hip and Knee Surgeons and chair of the Maurice Muller Foundation of North America.

Richard A. Berger, MD (Midwest Orthopaedics at Rush, Chicago). Dr. Berger has been instrumental in developing surgical instrumentation, techniques and implants for knee and hip surgery. He is interested in designing minimally invasive instrumentation and gender-specific implants.

Kevin Black, MD (Penn State Hershey Medical Center, Hershey, Pa.). Dr. Black has been president of the American Orthopaedic Association and chair of the department of orthopedics and rehabilitation at Penn State Hershey Medical Center. He has held leadership positions within the American Academy of Orthopaedic Surgeons and helped develop the sports medicine program at the Medical College of Wisconsin in Milwaukee.

Robert Booth, MD (Pennsylvania Hospital, Philadelphia). Dr. Booth is the chief of orthopedic surgery at Pennsylvania Hospital. He developed the Legacy Knee and participated in the development of the Gender Solutions Hi-Flex Knee from Zimmer.

Mathias P. Bostrom, MD (Hospital for Special Surgery, New York City). Dr. Bostrom is an attending orthopedic surgeon at Hospital for

Special Surgery. His current projects include the use of multigene assay to quantitatively describe the genetic cascade of growth factors and cytokines during fracture healing.

Mark Bowen, MD (Northwestern Orthopaedic Institute, Chicago). Dr. Bowen serves as a team physician for the Chicago Bears and previously acted as a team physician to the Chicago Blackhawks and Chicago Cubs. He is a member of the American Orthopaedic Society for Sports Medicine and the National Football League's Physicians Society.

William Bugbee, MD (Scripps Clinic, La Jolla, Calif.). Dr. Bugbee has expertise in joint reconstruction, arthritis treatment and cartilage transplantation. He previously served on the advisory board for AlloSource Medical and for the UCSD Center for Innovative Therapy.

Joseph Burkhardt, DO (Great Lakes Bone & Joint, Battle Creek, Mich.). Dr. Burkhardt is the team physician for the Battle Creek Revolution professional hockey team and former plant physician for two Ford Motor Company facilities. He has published several articles in professional journals and lectured nationally on treatment for cartilage damage and arthritis.

Charles Bush-Joseph, MD (Midwest Orthopaedics at Rush, Chicago). Dr. Bush-Joseph is a team physician for the Chicago White Sox and associate team physician for the Chicago Bulls. He serves as associate director of the Rush Orthopaedic Sports Medicine Fellowship Program and served on the editorial board for the *Journal of Knee Surgery* and *American Journal of Sports Medicine*.

James Caillouette, MD (Newport Orthopaedic Institute, Huntington Beach, Calif.). Dr. Caillouette has been involved in the development of multiple orthopedic devices, including DePuy Orthopaedics' Ci System, a computer assisted total knee system. He co-founded Advanced Osseous Technologies and developed the ultrasonic PMMA removal device, which was the springboard for the Ultradrive System.

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John J. Callaghan, MD (University of Iowa Hospitals & Clinics, Iowa City). Dr. Callaghan is the immediate past president of the American Academy of Orthopaedic Surgeons. He has published several articles in professional journals, with recent work focusing on mobile bearing knee replacements.

Roger Chams, MD (Illinois Bone & Joint Institute, Morton Grove, Ill.). Dr. Chams is an orthopedic sports medicine physician with a focus on arthroscopic and reconstructive surgery of the knee and shoulder. He is a member of the Arthroscopy Association of North America and American Orthopaedic Society for Sports Medicine.

Constance Chu, MD (University of Pittsburgh Medical Center). Dr. Chu is the director of the Cartilage Restoration Laboratory at the University of Pittsburgh School of Medicine. She also sits on the board of directors for the American Orthopaedic Society for Sports Medicine.

William G. Clancy, MD (University of Wisconsin Health, Madison). Dr. Clancy invented and perfected the ACL and PCL reconstruction procedures that are most often used by physicians today. He is a past president of the American Orthopaedic Society for Sports Medicine and is inducted into the organization's hall of fame.

Brian Cole, MD (Midwest Orthopaedics at Rush, Chicago). Dr. Cole is the head of the Cartilage Restoration Center at Rush and team physician for Chicago White Sox and Chicago Bulls. He has served as principle investigator for numerous FDA clinical trials and authored several hundred articles published in peer-reviewed journals.

Geoffrey S. Connor, MD (D1 Sports Medicine, Birmingham, Ala.). Dr. Connor is founder of D1 Sports Medicine in Birmingham and has cared for the professional athletes of the Atlanta Falcons and Atlanta

Thrashers. He is a member of American Orthopaedic Society for Sports Medicine and Arthroscopy Association of North America.

Thomas Coon, MD (St. Helena Coon Joint Replacement Institute, St. Helena, Calif.). During his career, Dr. Coon has been on the forefront of pioneering minimally invasive knee replacement surgery in the United States. He helped develop specialized instrumentation that is used to perform minimally invasive total knee arthroplasty.

Dan Cooper, MD (The Carrell Clinic, Dallas). Dr. Cooper is the head team physician for the Dallas Cowboys and the Dallas Stars. His practice focuses on minimally invasive arthroscopic and reconstructive surgical techniques for the knee and shoulder.

Andrew J. Cosgarea, MD (Johns Hopkins Medicine, Baltimore). Dr. Cosgarea is division chief of sports medicine and shoulder surgery at Johns Hopkins Medicine. He also serves as team physician for the Baltimore Orioles and Johns Hopkins athletics.

David Covall, MD (Resurgens Orthopaedics, Atlanta). Dr. Covall is former co-medical director of the Resurgens Joint Replacement Center and member of the board of directors. He founded a research consulting firm specializing in healthcare devices and designed implants for hip and knee procedures.

Leigh Ann Curl, MD (MedStar Sports Health, Columbia, Md.). Dr. Curl is the first female head team orthopedic surgeon for a professional football team, the Baltimore Ravens. Her professional interests include arthroscopic rotator cuff repair, shoulder stabilization, ACL repair and cartilage and meniscal transplant.

Walton Curl, MD (Wake Forest Baptist Health, Winston-Salem, N.C.). Dr. Curl chairs the Hall of Fame committee for the American Orthopaedic Society for Sports Medicine. He previously served in Vietnam, the U.S. Army Medical Corps and Operation Desert Storm in Saudi Arabia.

David Dalury, MD (Towson Orthopaedic Associates, Towson, Md.). Dr. Dalury is the chief of orthopedic surgery and chief of adult reconstructive surgery at St. Joseph Medical Center. His current research includes pain studies for total knee replacement and a brake response study for total knee arthroplasties.

Charles M. Davis, III, MD (Penn State Hershey Bone and Joint Institute, Hershey, Pa.). Dr. Davis is the chief of hip and knee joint arthroplasty at the Penn State Hershey Bone and Joint Institute. He has a professional interest in caring for patients with arthritis and avascular necrosis, and he serves as a committee chairman of the American Association of Hip and Knee Surgeons.

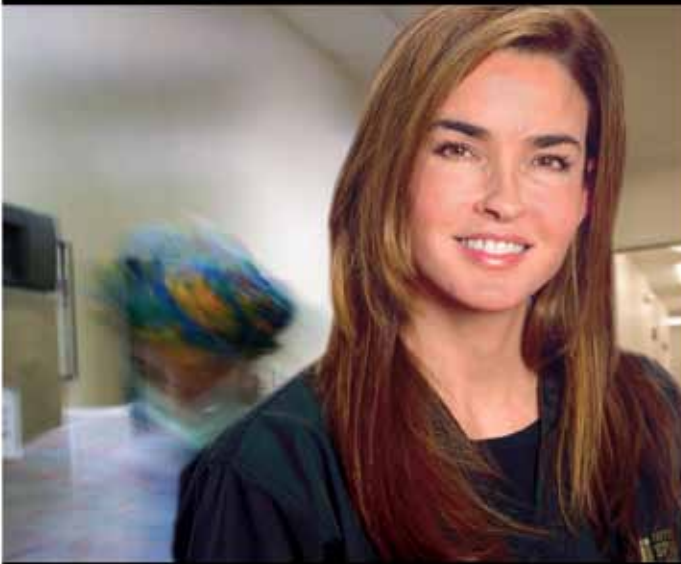
Kenneth E. DeHaven, MD (University Orthopaedic Associates of Rochester, Rochester, N.Y.) Dr. DeHaven has been elected into the university's Sports Hall of Fame for his work as team physician and afforded the Lifetime Achievement Award from The Bay Area Knee Society. He is past president of AOSSM, Arthroscopy Association of North America, International Knee Society and American Academy of Orthopaedic Surgeons.

Craig J. Della Valle, MD (Midwest Orthopaedics at Rush, Chicago). Dr. Della Valle is an associate professor and director of the adult reconstructive fellowship at Rush University Medical Center in Chicago. He also serves on the board of directors for The Knee Society and has a professional interest in complex primary and revision knee surgery.

Douglas A. Dennis, MD (Colorado Joint Replacement, Denver). Dr. Dennis is director of Operation Walk Denver and has served as president of the National Knee Society and American Association of Arthritic Hip and Knee Surgeons. He is the director of clinical research at the Rocky Mountain Musculoskeletal Research.

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Lawrence D. Dorr, MD (Good Samaritan Hospital, Los Angeles). Dr. Dorr is founder and medical director of the Dorr Arthritis Institute at Good Samaritan Hospital in Los Angeles and founder of Operation Walk. He has served as president of The Knee Society and The Hip Society and is a founder of the American Association of Hip and Knee Surgeons.

Jason L. Drago, MD (Stanford Hospital and Clinics, Stanford, Calif.). Dr. Drago is the head team physician for the Stanford University football program and serves as a team physician for the U.S. Ski and Snowboard Association. He is invested in tissue engineering studies focusing on the ability to harvest stem cells for knee surgery.

Neal ElAttrache, MD (Kerlan-Jobe Orthopaedic Clinic, Los Angeles). Dr. ElAttrache is the head team physician for the Los Angeles Dodgers. He also serves as orthopedic consultant to the Anaheim Mighty Ducks, St. Louis Rams, Los Angeles Lakers, Los Angeles Kings and the PGA Tour. He currently serves as the chairman of the Kerlan-Jobe Orthopaedic Research Foundation.

Burton F. Elrod, MD (Elite Sports Medicine and Orthopaedic Center, Nashville, Tenn.). Dr. Elrod is the head team physician for the Tennessee Titans and has been affiliated with the Los Angeles Lakers, Los Angeles Dodgers and Los Angeles Kings. He has professional interests in arthroscopic surgery of the knee, shoulder and elbow.

Gerald Engh, MD (Anderson Orthopaedic Clinic, Arlington, Va.). Dr. Engh is a past president of The Knee Society, fellow with the American Academy of Orthopaedic Surgeons and a member of the American Orthopaedic Society. In addition to his practice, Dr. Engh has served as president of the Anderson Orthopaedic Research Institute, where he is also a director of knee research.

Jack Farr, MD (OrthoIndy, Indianapolis). Dr. Farr has designed a meniscal transplant system and a knee realignment system as well as participated as a principle investigator in ongoing cartilage research. He regularly performs advanced cartilage restoration techniques, partial and total knee replacements.

Thomas Fehring, MD (OrthoCarolina, Charlotte, N.C.). Dr. Fehring is co-director of the Hip and Knee Center and the director of the adult reconstructive fellowship at OrthoCarolina. He holds four U.S. patents for his mobile and fixed prosthetic knee systems and enhanced biocompatible implants and alloys.

Mark P. Figgie, MD (Hospital for Special Surgery, New York City). Dr. Figgie is the chief of the surgical arthritis services at Hospital for Special Surgery, where he oversees the care

of patients with arthritis, lupus, lyme disease and hemophilia. His clinical practice focuses on minimally invasive surgery, joint replacement procedures and surgery for rheumatoid arthritis.

David Fisher, MD (OrthoIndy, Indianapolis). Dr. Fisher serves as the director of the Total Joint Center of Excellence at the Indiana Orthopaedic Hospital and a member on the board of directors at OrthoIndy. He is a past president of the Indiana Orthopaedic Research Foundation, where he now serves as a board member.

James Fox, MD (Synergy Health Medical Group, West Hills, Calif.). Dr. Fox was a founding partner of Southern California Orthopedic Institute and is now in private practice with Knee & Joint and Sports Medicine Specialists. He has served as a team physician for the Olympic soccer program and published extensive research into orthopedic care.

Freddie H. Fu, MD (University of Pittsburgh Medical Center). Dr. Fu is the chairman of the department of orthopedic surgery at UPMC and the University of Pittsburgh School of Medicine. He was instrumental in establishing the Sports and Preventative Medicine Institute, which is now located in the UPMC Sports Performance Complex.

David Geier, MD (Medical University of South Carolina, Charleston). Dr. Geier is the director of the Medical University of South Carolina Sports Medicine, a program he created. He is the head team physician for the Charleston Battery professional soccer team and chairman of the American Orthopaedic Society for Sports Medicine public relations committee.

John Gill, MD (Dallas Sports Medicine Specialists). Dr. Gill is the founder of Dallas Sports Medicine Specialists and has served as the president of the Texas Orthopaedic Association. He is on the board of directors for the American Academy of Orthopaedic Surgeons.

Thomas J. Gill, IV, MD (Massachusetts General Hospital, Boston). Dr. Gill is the medical director for the New England Patriots and a team physician for the Boston Bruins. He is also the director of the Harvard/MGH sports medicine fellowship program and co-director of the MGH Orthopedic Bioengineering Laboratory.

Raj Ghate, MD (Northwestern Orthopaedic Institute, Chicago). Dr. Ghate is an active volunteer for Operation Walk Chicago and a clinical instructor of orthopedics at Northwestern University's Feinberg School of Medicine. He is a member of the American Academy of Orthopaedic Surgeons and American Association of Hip and Knee Surgeons.

Scott Gillogly, MD (Atlanta Knee and Shoulder Clinic). Dr. Gillogly has served as chairman of the American Academy of Orthopaedic Sur-

geons committee on sports medicine evaluation and is a fellow with the American Orthopaedic Society for Sports Medicine. He founded the Atlanta Knee and Shoulder Clinic and the subspecialty group, Atlanta Sports Medicine & Orthopaedic Center.

E. Marlowe Goble, MD (Salt River Orthopedics, Afton, Wyo.). Dr. Goble holds more than 70 patents and performed one of the first minimally invasive knee replacement procedures. During his career, he served as lead surgeon for Zimmer on the prosthetic ACL development and as the team physician for Utah State University in Logan. He has co-founded five companies, including MedicineLodge, an orthopedic technology development firm.

William L. Griffin, MD (OrthoCarolina, Charlotte, N.C.). Dr. Griffin is the chairman of the OrthoCarolina Research Institute and director of the OrthoCarolina Hip & Knee Center. He has received the Mark Coventry Award from The Knee Society for his participation in research on the premature wear and osteolysis in PFC modular total knees.

Steven B. Haas, MD (Hospital for Special Surgery, New York City). Dr. Haas is the chief of the knee service at Hospital for Special Surgery. He has developed technique and instrumentation for performing minimally invasive knee replacement procedures, and holds U.S. patents for his innovations.

Arlen D. Hanssen, MD (Mayo Clinic, Rochester, Minn.). Dr. Hanssen has been president of The Knee Society and has served in leadership positions with The Hip Society. He has also served as the vice president of the International Congress for Joint Reconstruction.

Christopher Harner, MD (University of Pittsburgh Medical Center). Dr. Harner's research focuses on surgical techniques of the anterior and posterior cruciate ligaments and his research has earned many awards from organizations like the American Orthopaedic Society for Sports Medicine and International Society of Arthroscopy, Knee Surgery and Orthopedic Sports Medicine. He has served as president for the Pennsylvania Orthopaedic Society.

Steven F. Harwin, MD (Beth Israel Medical Center, New York City). Dr. Harwin is the chief of adult reconstructive surgery of the hip and knee and director of the Total Joint Replacement Bloodless Surgery Program at Beth Israel Medical Center. During his more than 30-year career, he has invented and designed patented orthopedic devices.

William L. Healy, MD (Lahey Clinic, Burlington, Mass.). Dr. Healy is former president of The Knee Society and has a professional interest in caring for patients with hip and knee arthritis and performing joint replacement pro-

cedures. He has been honored by the Arthritis Foundation for his excellence and leadership in arthritis care.

Jon Henry, MD (Aurora BayCare Orthopaedic & Sports Medicine, Green Bay, Wis.). Dr. Henry is the medical director of Aurora BayCare Sports Medicine. He has a clinical interest in knee re-alignment, ligament reconstruction and performing various techniques for cartilage transplantation, allograft and autograft cartilage transfers, biologic knee resurfacing and unloading realignment osteotomies.

Aaron Hofmann, MD (Hofmann Arthritis Institute, Salt Lake City). Dr. Hofmann is founder of Hofmann Arthritis Institute, chief of orthopedics at SLC Veterans Affairs Medical Center and director for the Center for Precision Joint Replacement at Salt Lake Regional Medical Center. His primary interests include joint replacement surgery and researching bone ingrowth, biomechanics and biomaterials.

Timothy Hupfer, MD (OrthoIndy, Indianapolis). Dr. Hupfer is the team physician for the Indiana Pacers and is a member of the American Association of Hip and Knee Surgeons. He also serves on the NBA Team Physicians Society and with the American Academy of Orthopaedic Surgeons.

Peter Indelicato, MD (NeuroSpine Institute of Orlando). Dr. Indelicato has been a consulting team physician for the Miami Dolphins and retired head team physician for the University of Florida. He currently serves as president of the American Orthopaedic Society for Sports Medicine and has been the president of the Herodicus Society.

O. Tom Johns, Jr., MD (Tennessee Orthopaedic Alliance, Nashville). Dr. Johns has a professional interest in arthroscopic surgery, minimally invasive technique and total knee arthroplasty. He has been a delegate for the state of Tennessee to the American Orthopaedic Society for Sports Medicine and received the society's Thomas Brady Award in 2010.

Peter Jokl, MD (Yale Medical Center, New Haven, Conn.). Dr. Jokl is the section chief of sports medicine and program director for the orthopedic residency at Yale. He is a director-at-large of the Arthroscopy Association of North America and a member of the American Orthopaedic Society for Sports Medicine.

Chris Kaeding, MD (Ohio State University Sports Medicine, Columbus). Dr. Kaeding is the co-director of OSU Sports Medicine. He has served as a team physician for the US Olympic Committee and the national men's and women's basketball teams.

E. Michael Keating, MD (St. Francis Medical Group, Beech Grove, Ind.). Dr. Keating is a joint replacement surgeon with the St. Francis Medical Group and sits on the board of directors of The

Knee Society. He has a professional interest in hip and knee replacement surgery and his research on knee issues has received national acclaim.

Mininder S. Kocher, MD (Children's Hospital of Boston). Dr. Kocher is the associate director of the division of sports medicine at Children's Hospital of Boston. He also sits on the board of directors for the American Academy of Orthopaedic Surgeons and is on the council of delegates for the American Orthopaedic Society for Sports Medicine.

Frank Kolisek, MD (OrthoIndy, Indianapolis). Dr. Kolisek is the president of OrthoIndy and medical director of the St. Vincent Center for Joint Replacement Surgery. He is involved in the design of hip and knee implants and has a professional interest in soft tissue sparing minimally invasive joint procedures.

Rob LaPrade, MD (The Steadman Clinic, Vail, Colo.). Robert LaPrade, MD is a complex knee and sports medicine physician at The Steadman Clinic and director of biomechanics research at Steadman Philippon Research Institute. He has published more than 100 peer-reviewed scientific articles and earned the Excellence in Clinical Research Award from the American Orthopaedic Society for Sports Medicine for his research in knee reconstruction.

David G. Lewallen, MD (Mayo Clinic, Rochester, Minn.). Dr. Lewallen is an orthopedic surgeon at Mayo Clinic and chair of the American Joint Replacement Registry. He is also a member of American Academy of Orthopaedic Surgeons and a past president of the American Association of Hip and Knee Surgeons.

Jay R. Lieberman, MD (New England Musculoskeletal Institute, Southington, Conn.). Dr. Lieberman is the director of the New England Musculoskeletal Institute and chairman of the orthopedic surgery department at the University of Connecticut Health Center. He is a member of The Knee Society and a committee chairman in the American Association of Hip and Knee Surgeons.

Robert Limoni, MD (Aurora BayCare Orthopaedic & Sports Medicine, Green Bay, Wis.). Dr. Limoni has a professional interest in treatment for arthritis, total joint replacement, gender knee and minimally invasive procedures. He is a principle investigator with the Aurora BayCare clinical research department and recently received an innovation award for his work.

Adolph V. Lombardi, MD (Joint Implant Surgeons, New Albany, Ohio). Dr. Lombardi is the president of Joint Implant Surgeons and designer of the Maxim Knee System and Vanguard Knee System. He also developed the patient-specific Signature System for total knee arthroplasty. He sits on the board of directors for The Knee Society and is second vice president of The Hip Society.

Stephen J. Lombardo, MD (Kerlan-Jobe Orthopaedic Clinic, Los Angeles). Dr. Lombardo currently serves as a team physician for the Los Angeles Lakers and orthopedic surgeon consultant for the Los Angeles Dodgers, Los Angeles Kings and Los Angeles Angels of Anaheim. He is a past president of the National Hockey League Team Physicians Society and National Basketball Association Team Physicians Society.

Jess Lonner, MD (Rothman Institute, Philadelphia). Dr. Lonner is a knee surgeon at Rothman Institute and president of the board of governors of the Philadelphia Orthopaedic Society. He also sits on the board of directors of The Knee Society and the editorial board for the *Journal of Arthroplasty*.

Walter Lowe, MD (University of Texas Medical School, Houston). Dr. Lowe is the chairman and professor in the department of orthopedic surgery at the University of Texas Medical School in Houston. He is also chief of orthopedic surgery and director of the Memorial Hermann Sports Medicine Institute at Memorial Hermann-Texas Medical Center and LBJ General Hospital in Houston. He is the head team physician for the Houston Texans.

William Macaulay, MD (Columbia Orthopaedics, New York City). Dr. Macaulay is chief of the division of adult reconstruction and director of the center for hip and knee replacement at Columbia University in New York City. He regularly performs minimally invasive hip and knee procedures, though he places emphasis on conservative treatment.

David Mansfield, MD (El Paso Orthopaedic Surgery Group, El Paso, Texas). Dr. Mansfield is the president of El Paso Orthopaedic Surgery Group. He serves on the board of councilors for the American Academy of Orthopaedic Surgeons and has been elected president of the Texas Orthopedic Association for 2012-2013.

John T. Mattson, MD (Berkeley Orthopaedic Medical Group, Berkeley, Calif.). Dr. Mattson is a physician with Berkeley Orthopaedic Medical Group and a member of the clinical faculty at the University of California San Francisco Medical Center. He has a professional interest in knee arthroscopy and ACL reconstruction.

Brian McKeon, MD (Boston Sports & Shoulder Center). Dr. McKeon has been head team physician for the Boston Celtics for more than nine seasons. He participates in studies on articular cartilage restoration and minimally invasive surgical techniques and serves as an assistant clinical professor of orthopedics at Tufts University School of Medicine in Boston.

Keith Meister, MD (TMI Sports Medicine, Arlington, Texas). Dr. Meister is director of TMI Sports Medicine and serves as head team physician for the Texas Rangers. He belongs to the

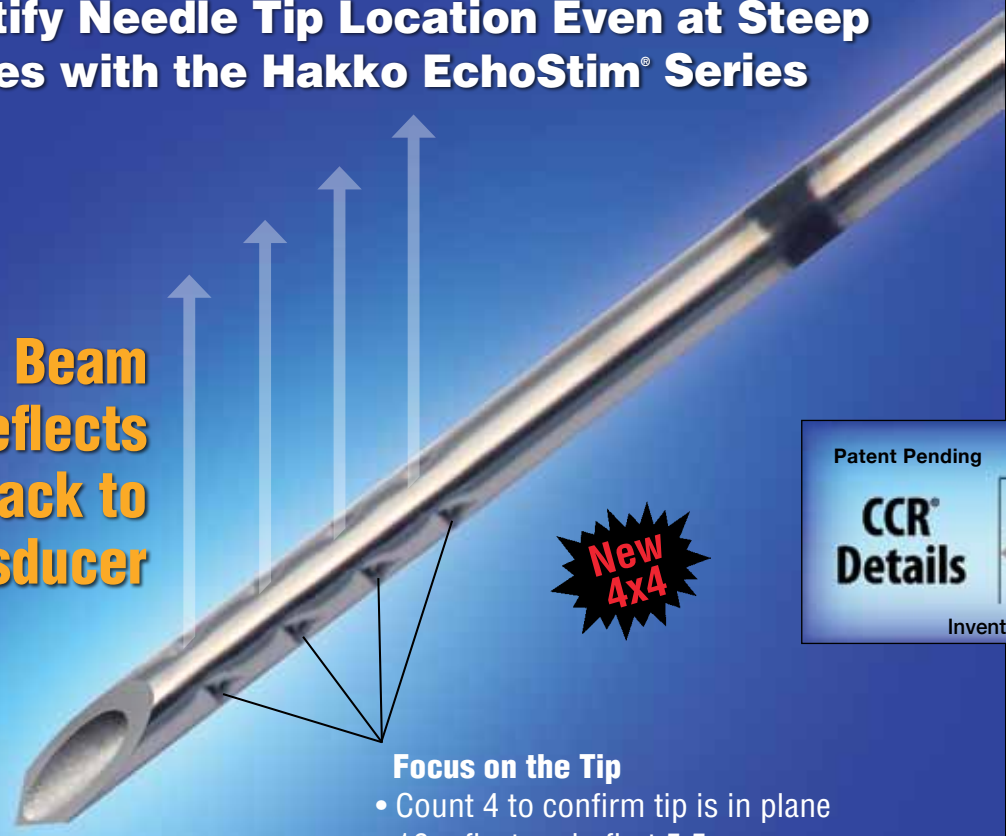
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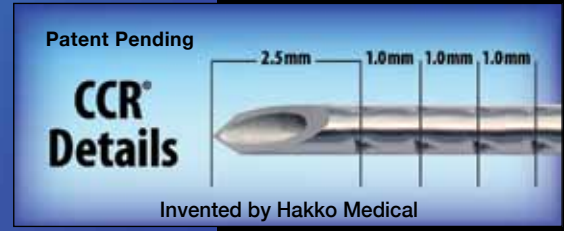
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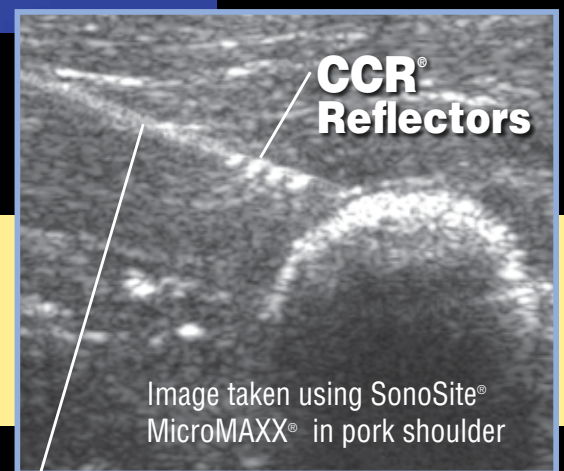


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Tom Minas, MD (Brigham and Women's Hospital, Boston). Dr. Minas is founder and director of the Cartilage Repair Center at Brigham and Women's Hospital. He has designed an interpositional device and patellofemoral joint prosthesis to help osteoarthritic patients avoid total knee replacement.

James B. Montgomery, MD (Texas Orthopaedic Associates, Dallas). Dr. Montgomery served as the physician to the U.S. Delegation for the 2004 Olympic Games in Athens, Greece, and has also served as the president of the Texas Sports Medicine Society. He is a fellow with the American Academy of Orthopaedic Surgeons.

David J. Mayman, MD (Hospital for Special Surgery, New York City). Dr. Mayman serves as the co-director of the Computer Assisted Surgery Center at Hospital for Special Surgery. His current research focuses on the continued advancement of computer navigation tools, building upon his early research that won numerous recognitions.

Frank Noyes, MD (Cincinnati Sportsmedicine and Orthopaedic Center). Dr. Noyes is the chairman and medical director of the Cincinnati Sportsmedicine and Orthopaedic Center and founder of The Noyes Knee Institute. He has served as a team physician for the Cincinnati Bengals and is a member of American Academy of Orthopaedic Surgeons, American Orthopaedic Society for Sports Medicine and Arthroscopy Association of North America.

Mary I. O'Connor, MD (Mayo Clinic, Jacksonville, Fla.). Dr. O'Connor has served as president for the International Society of Limb Salvage and the Musculoskeletal Research Society as well as president-elect of the American Association of Hip and Knee Surgeons. She has been involved in several research projects and published articles in professional journals.

Mark W. Pagnano, MD (Mayo Clinic, Rochester, Minn.). Dr. Pagnano serves on the board of directors of The Knee Society and is a member of the American Academy of Orthopaedic Surgeons. He has conducted research on knee-related topics and published his work in professional journals.

Richard Parker, MD (Cleveland Clinic). Dr. Parker is the education director of sports health at Cleveland Clinic and is currently the head team physician for the Cleveland Cavaliers. He has a

professional interest in treating athletic knee injuries, cartilage injuries, primary knee replacement and total joint replacement.

Michael Lloyd Parks, MD (Hospital for Special Surgery, New York City). Dr. Parks has been the president of the New York State Society of Orthopedic Surgeons and served as a member of the American Academy of Orthopaedic Surgeons board of directors. He has an expertise in minimally invasive hip and knee replacement surgery and arthroscopy of the knee.

Brian S. Parsley, MD (Baylor College of Medicine, Houston). Dr. Parsley is a clinical associate professor and director of the adult reconstruction fellowship at Baylor College of Medicine. He was instrumental in the development of the joint replacement program at Christus St. Joseph Hospital in Houston.

Dinesh Patel, MD (Massachusetts General Hospital, Boston). Dr. Patel is the chief of arthroscopic surgery and one of the pioneering surgeons to use arthroscopic technology for joint procedures. He was a founding member of the Arthroscopy Association of North America and International Association of Arthroscopy.

Lonnie Paulos, MD (Andrews Institute of Orthopaedics & Sports Medicine, Gulf Breeze, Fla.). Dr. Paulos holds more than 20 U.S. patents and developed numerous surgical procedures related to those devices. He is the medical director of the Andrews-Paulos Research & Education Institute in Gulf Breeze, Fla.

Scott Powell, MD (Stetson Powell Orthopedics and Sports Medicine, Burbank, Calif.). Dr. Powell co-founded Stetson Powell Orthopedics and Sports Medicine with his partner, Bill Stetson, MD. He has a professional interest in knee care and is on the board of directors for the Arthroscopy Association of North America.

David Raab, MD (Illinois Bone and Joint Institute, Morton Grove, Ill.). Dr. Raab is a senior partner and founding member of the Illinois Bone and Joint Institute. He is a fellow with the American Academy of Orthopaedic Surgeons and holds an academic appointment with Northwestern University Medical School in Chicago.

Chitranjan Ranawat, MD (Hospital for Special Surgery, New York City). Dr. Ranawat is a physician at the Hospital for Special Surgery and has served as director of the Ranawat Orthopaedic Center at Lenox Hill Hospital in New York City. He is a founding president of The Knee Society and president of American Association of Hip and Knee Surgeons.

Michael Redler, MD (The Orthopaedic & Sports Medicine Center, Trumbull, Conn.). Dr. Redler is a founding partner of OSM and is an orthopedic consultant to Major League Lacrosse. He is a fellow of the American Academy of Or-

thopaedic Surgeons and a member of the American Orthopaedic Society for Sports Medicine.

Bruce Reider, MD (The University of Chicago Medical Center). Dr. Reider is the director of sports medicine at the University of Chicago and editor-in-chief of the *American Journal of Sports Medicine*. He served a term as president of the Herodicus Society and team physician for the Chicago Blackhawks.

John Richmond, MD (Boston Sports & Shoulder Center). Dr. Richmond serves as a professor of orthopedic surgery at Tufts University School of Medicine in Boston and maintains an interest in the research and development of tissue engineered ligament and tendon substitute. He is a fellow with the American Academy of Orthopaedic Surgeons.

Michael D. Ries, MD (UCSF Medical Center, San Francisco). Dr. Ries is chief of the University of California San Francisco arthroplasty service where he regularly treats patients with arthritis in the knee and hip. During his career, he has served on the board of directors for the Foundation for the Advancement in Research in Medicine Orthopedics.

William J. Robb, III, MD (Illinois Bone and Joint Institute, Morton Grove, Ill.). Dr. Robb has performed more than 1,000 computer-assisted knee replacements and has a professional interest in minimally invasive procedures. He is assistant clinical professor at Northwestern University in Chicago.

Richard Rothman, MD (Rothman Institute, Philadelphia). Dr. Rothman is the founder of Rothman Institute and editor-in-chief of the *Journal of Arthroplasty*. He is a member of several professional societies, including American Academy of Orthopaedic Surgeons, American Association of Hip and Knee Surgeons and American Association for Advancement of Science.

Richard Scott, MD (Brigham and Women's Hospital, Boston). Dr. Scott is the chief of adult reconstructive services at Brigham and Women's Hospital in Boston, where he has previously served as chief of implant service and chief of the joint arthroplasty fellowship program. He is past president of The Knee Society.

Thomas Sculco, MD (Hospital for Special Surgery, New York City). Dr. Sculco is the surgeon-in-chief and Korein-Wilson professor of orthopedic surgery at the Hospital for Special Surgery. He is also the chairman of the department of orthopedic surgery at Weill Cornell Medical College in New York City. He has received the Arthritis Foundation's Lifetime Achievement Award.

Giles R. Scuderi, MD (Insall Scott Kelly Institute, New York City). Dr. Scuderi is one of the directors at the Insall Scott Kelly Institute for Orthopedics and Sports Medicine. He is current-

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Nicholas A. Sgaglione, MD (Hofstra North Shore-LIJ School of Medicine, Hempstead, N.Y.). Dr. Sgaglione is the chairman of the orthopedic surgery department at the Hofstra North Shore-LIJ School of Medicine. He is currently the first vice-president of the Arthroscopy Association of North America and is a member of the American Academy of Orthopaedic Surgeons and American Orthopaedic Society for Sports Medicine.

Clarence L. Shields, Jr., MD (Kerlan-Jobe Orthopaedic Clinic, Los Angeles). Dr. Shields has served as president of the American Orthopaedic Society for Sports Medicine and received the organization's "Mr. Sports Medicine" award in 2006. He is currently a neutral physician for the National Football League.

K. Donald Shelbourne, MD (Shelbourne Knee Center at Methodist Hospital, Indianapolis). Dr. Shelbourne has pioneered the contralateral ACL reconstruction, which uses a patellar tendon graft from the non-injured knee for the surgery and developed the accelerated ACL reconstruction rehabilitation protocol. His research focuses on advancing surgical treatment and rehabilitation of ACL injuries.

Joshua Siegel, MD (Access Sports Medicine, Exeter, N.H.). Dr. Siegel is sports medicine director at Access Sports Medicine & Orthopaedics and a founding member of Northeast Surgical Care in Newington, N.H. He is a team physician for the U.S. Ski and Snowboard Team.

Robert Stanton, MD (Orthopaedic Specialty Group, Fairfield, Conn.). Dr. Stanton is the chairman and managing partner at Orthopaedic Specialty Group in Fairfield, Conn., and immediate past president of the American Orthopaedic Society for Sports Medicine. He is also active in the Arthroscopy Association of North America and International Society for Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine.

Richard Steadman, MD (Steadman Clinic, Vail, Colo.). Dr. Steadman is the co-founder of

the Steadman Clinic in Vail, Colo. He has developed surgical and rehabilitation techniques that permit athletes to return to pre-injury competitive levels in their sports and several of his procedures are now used by surgeons worldwide to treat knee disorders.

Mark Steiner, MD (Sports Medicine Associates, Chestnut Hill, Mass.). Dr. Steiner serves as a physician with Sports Medicine Associates and chief of orthopedic sports medicine at New England Baptist Hospital in Boston. He sits on the board of directors for the American Orthopaedic Society for Sports Medicine.

Kevin Stone, MD (The Stone Clinic, San Francisco). Dr. Stone is chairman of the Stone Research Foundation in San Francisco where physicians conduct research in advanced surgical techniques and tissue regeneration for orthopedic sports medicine. He also recently founded the first dedicated center for meniscus transplantation at the Stone Research Foundation.

Michael J. Stuart, MD (Mayo Clinic, Rochester, Minn.). Dr. Stuart is vice chair of orthopedic surgery and co-director of sports medicine at Mayo Clinic. He is chief medical officer with the National Hockey League and is a member of the International Ice Hockey Federation.

David Stulberg, MD (Northwestern Memorial Hospital, Chicago). Dr. Stulberg is the founder and director of the Joint Reconstruction and Implementation Service at Northwestern Memorial Hospital. He is a co-founder for the International Society for Technology in Arthroplasty as well as the International Society for Computer Assisted Orthopaedic Surgery.

David Teuscher, MD (Beaumont Bone & Joint Institute, Beaumont, Texas). Dr. Teuscher has served as president of the Texas Orthopedic Association. He has also served on the American Association of Orthopaedic Surgeons board of directors and as the Texas delegate to the American Medical Society.

Thomas Thornhill, MD (Brigham and Women's Hospital, Boston). Dr. Thornhill is the chairman of the department of orthopedic surgery at Brigham and Women's Hospital in Boston.

He is a former president of The Knee Society and his primary research focuses on developing treatment approaches for arthritis and joint.

Michael E. Trice, MD (Johns Hopkins Medicine, Baltimore). Dr. Trice is the director of the Johns Hopkins Cartilage Restoration Center. He has a professional interest in autologous chondrocyte implantation, osteochondral allografts and arthroscopy of the knee.

Robert Trousdale, MD (Mayo Clinic, Rochester, Minn.). Dr. Trousdale is an orthopedic surgeon at Mayo Clinic with a professional interest in adult knee and hip reconstructive surgery. He is a member of The Knee Society, American Association of Hip and Knee Surgeons and American Academy of Orthopaedic Surgeons.

Russell Warren, MD (Hospital for Special Surgery, New York City). Dr. Warren has been surgeon-in-chief with Hospital for Special Surgery and serves as team physician for the New York Giants. He was inducted into the American Orthopaedic Society for Sports Medicine Hall of Fame for his contributions to the field.

Riley J. Williams, III, MD (Hospital for Special Surgery, New York City). Dr. Williams is the director of the Institute for Cartilage Repair at Hospital for Special Surgery and serves as the head team physician for the New Jersey Nets and New York Red Bulls professional soccer team. He conducts research focusing on ACL and PCL reconstruction and cartilage repair.

Edward Wojtys, MD (University of Michigan Health System, Ann Arbor). Dr. Wojtys is the chief medical director of MedSport Sports Medicine Program and associate director of the Bone & Joint Injury Prevention & Rehabilitation Center at the University of Michigan. His practice focuses on knee ligament injuries, knee dislocations, meniscal injuries, degenerative knee joint disease and female knee injury susceptibility.

David Yasgur, MD (Mount Kisco Medical Group, Katonah, N.Y.). Dr. Yasgur is a fellow with the American Academy of Orthopaedic Surgeons and diplomat of the National Board of Medical Examiners. He conducts research on topics such as total joint replacement. ■

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Are Partial Knee Replacements a Passing Trend or the Future of Knee Care?

By Laura Miller

Here are 13 joint replacement surgeons and industry experts discussing whether partial knee replacements are a passing trend or the way of the future.

Michael E. Ciminello, MD, Orthopedic Surgeon, Peconic Bay Medical Center, Riverhead, N.Y.: I think partial knee replacements will always be an operation in a joint replacement surgeon's armamentarium, but I don't necessarily think it will replace totals as the mainstay of treatment. I do think that it is an excellent operation for a select few patients and I will perform the procedure for patients who are appropriate candidates. That being said, I don't often see those types of patients.

Additionally, I don't think the newer technology has much to do with implant longevity. Successful outcomes for joint replacement, in general, are more closely linked to proper patient selection and surgical technique than any particular implant. The outcomes of partial knee replacements are less predictable than total knee replacement because identifying an appropriate candidate for a partial is more difficult. The relatively unpredictable nature of partial knee replacement surgery is precisely why there have been multiple cycles of popularity throughout the decades amongst orthopedic surgeons. Total knee and hip replacements will not fall out of fashion because the operations work and are predictable.

J. Dean Cole, MD, Orthopedic Surgeon, Florida Hospital Fracture Care Center, Orlando: We have seen clear advantages in partial knee replacements because they are a less invasive procedure and if we use a robot, we are able to restore the patients' kinematics in a positive manner. With that in mind, I believe we are going in the right direction and partial knee replacements will become more commonplace in the future. If we believe that the patients' arthritic process is mechanically related and the cartilage has degenerated, and the implants we use can stand up to wear, I think the procedure will last.

However, if the cartilage generation is from systemic factors, then the patient is faced with a progressive problem and the rest of the knee will be affected. In that case, unicompartmental knee replacement will only be a temporary fix. My experience is based on my patients' feedback, and I believe partial knee replacements will always have an important role in our armamentarium to treat knee arthritis. But, if expansion of the procedure takes over treatment for a larger patient population than it should, it will only result in failure.

Charles Gatt, Jr., MD, University Orthopaedic Associates, New Brunswick, N.J.: There is a lot of data telling us the number of knee replacement procedures is going to increase dramatically over the next five years, and there aren't enough fellowship-trained knee surgeons to meet those needs. New technology will help more general orthopedic surgeons perform good, reproducible knee replacements. I think there's a role for patient-specific replacements where they do an MRI or CT scan to custom design the cutting blocks because it allows the operation to be done without drilling a hole in the femoral canal for alignment. This plays a big roll in minimizing blood loss in the operation. The same holds true for robotics — you can use the robot without using the intramedullary cutting guides.

I don't think you are going to see a significant increase in the volume of unicompartmental knee replacements in the near future. Additionally, in the United States, surgeons are becoming less comfortable with high tibial osteotomies.

Henry Finn, MD, Medical Director, Chicago Center for Orthopedics at Weiss Memorial Hospital and Professor of Surgery,

University of Chicago: At any given time, maybe 5-10 percent of knees are being done as partials. More often, orthopedic surgeons performing partial knee replacements have a philosophy that doing them is better for the appropriately selected patients. From my standpoint, after doing close to 10,000 knee replacements, I can't reliably guarantee a patient that they are going to be as satisfied with a partial as they are with a total, so that has limited my use of the partial.

If I were the patient, and the surgeon said that both partial and total knee replacements would have the same outcomes, I would pick the partial — but I just don't think that's the case. At this point, I would need to see more evidence-based literature that says partials are as reliable and as durable as total knee replacements. The results may change with better implant designs, but the way the partial is anchored to the bone creates more stress and sometimes patients have pain related to this stress. Partial knee replacements tend to fail more quickly in that case. I don't know what the future will hold with new implants, but the current ones we have today are not proven in the literature to be as successful in both relieving pain and restoring function as the total knee replacement.

John Lynch, MD, Orthopedic Surgeon, North Suburban Orthopedic, Malden, Mass.: In the past, the standard line against unicompartmental knee replacements said they would fail, so why do it if you'll have to replace it a few years later? Like with many things, the technology has made the procedure more durable. Even total knee replacements are revised — they don't last forever. A lot of your opinion on knee replacements depends on what statistics you look at. The majority of my practice is middle-aged or older patients who are asking to continue their athletic activities and if unicompartmental knees are done for those patients, there is more risk for failure. These patients push their agenda, which means more wear will be placed on the implant.

However, there are a lot of advances taking place in knee replacement. Who knows what surgeons will have 20 years from now — there might be a different material that would create a better replacement. For patients, partials are much less painful and they can begin rehabilitation quicker, so I feel happy for the patients who are candidates. I often have patients who are candidates for partials go to a larger academic medical center for a second opinion and are told they need totals. These patients often come back to me because they would rather have a partial. I think partials will create a niche: 20-30 percent of patients who have totals could do just as well with some definite advantages with partial knee replacements.

Surgeons still need to be careful because even though there are advantages to partial knee replacements, not everyone should have one. If it gets too popular, people will expand the limits too much. That's always a risk with new technology.

Eric Millstein, MD, Orthopedic Surgeon, DISC, Beverly Hills, Calif.: As we continue to expand our scope of minimally invasive procedures, the interest in partial (unicompartmental) knee replacement will also grow, among both surgeons and patients. That said, we must remember to exercise caution in considering patients for such a procedure, as not everyone will be a candidate. If the patient doesn't have isolated arthritis in one compartment, for example, they will ultimately be unhappy with the procedure, either immediately or within a few years of surgery.

David Payne, MD, Orthopedic Surgeon, Chapman Orthopedic Institute, Orange, Calif.: There is a lot of theory out there in orthopedics, but the actual real deal is more important than that. You have to un-

dergo extensive training, including a joint replacement fellowship, in order to perform unicompartmental knee replacements well. The hospitals also have to be set up for the procedure — we have a joint program here that can support it. Patient selection is also very important for good outcomes. You want to make sure the patient is a compliant patient who understands the depth of what they are getting into.

Milton Smit, MD, Oak Orthopedics, Bradley, Ill.: I personally think that unicompartmental knee replacements can only be done in a very small number of patients. I don't think the patient population will ever grow to a large amount — over 5 percent of patients — because the indications are limited. The design is getting better for unicompartmental knee replacements, but so are the totals. In both instances, the outcomes will be better for surgeons who perform a higher volume of cases.

In the future, I think both procedures will continue to improve. There will be a lot of joint replacements performed within the coming years because there are more baby boomers who need them, and there are more people who wish to remain active later in life. Additionally, there are a lot of obese people who wear out their knees quickly, and we need to provide the best solution for them as possible.

Geoffrey Westrich, MD, Director for Research for Joint Replacement, Hospital for Special Surgery, New York City: As time goes on, the technology is always getting better. Not only does that help the design of the prosthesis and accuracy of placement, but it also improves the diagnostic modalities we have. As technology gets better, we'll have better ways to look at the knee before surgery. The strength of the

magnet in an MRI is improving and we have better protocols for using MRI scanners to look at the cartilage than we did 10 years ago. Eventually, there will also be better technology during surgery where surgeons will be able to detect a problem that might not be visible to the naked eye.

The revision technology will also get better in the future and we won't be as apprehensive about converting partials into totals. It's not a surgery that should be done by someone who doesn't do a lot of them. There is a steep learning curve, and patients might do better if they go to a joint replacement hospital so they can have it done technically in the right way.

Delwyn Worthington, MD, Orthopedic Surgeon, Arizona Orthopaedic Associates, Phoenix: I think partial knee replacements will stick around, but we will further clarify the specific indications for the best outcomes. For patients who are active and have the appropriate indications, I think the data will hold out to show that partial knee replacements will provide them with a higher level of function than total knee replacements.

There is a lot of new technology coming out now for partial knee replacements and I think it is still in its learning stages. The idea of robotics is mostly to allow the surgeon to perform the procedure with a more predictable outcome, but it still takes an experienced surgeon to reach a good outcome. At some point in time, as the technology becomes improved and it becomes easier to use robotics, partial knee replacement may also become a faster procedure. ■

Being a Team Physician for Professional Athletes: Q&A With Indiana Pacers Team Physician Dr. Timothy Hupfer

By Laura Miller

Orthopedic and sports medicine physicians take on a great deal of responsibility when they agree to serve as a team physician for athletes at any level, and the commitment is especially cumbersome for professional teams. Timothy Hupfer, MD, an orthopedic surgeon with OrthoIndy in Indianapolis, discusses the challenges and rewards associated with his role as the Indiana Pacers head team physician.

Q: What do you find most challenging about being head team physician for a professional athletic team?

Dr. Timothy Hupfer: You're dealing with athletes who, when they are injured, want to be healed yesterday. These athletes' livelihoods depend on being able to play sports and perform well. We also have to coordinate communication with the team management about the athletes' condition and treatment plan.

Because everything has to be done so quickly, you have to limit your office hours and your surgery schedule during the season. You often have

to end the operating day earlier on game days and be prepared to evaluate a player at a moment's notice. The athlete and team depend on you to schedule an MRI and communicate the results quickly, which may mean putting some other responsibilities on hold. I also travel with the team on the road during the playoffs, and that takes time away from my regular practice.

Q: How do you respond to injured athletes who want to play through the pain?

TH: You always do what is best for the athlete. We always tell them we won't clear them for play if there is a significant risk of injury. When I release them, I tell them they can push to the limits of their capabilities. You want to create a rapport with the players so they trust you won't release them too soon or wait too long. Additionally, a lot of these players want second and third opinions, and you can't let that affect your ego. They will respect your opinion, but they want to hear from others as well, and they often want your help with that. You can guide them to other specialists.

Q: What is the most rewarding part of your role as team physician?

TH: I think it's rewarding to be able to work with some of the best athletes in the world, and a first-class training staff. It also helps keep me on the cutting edge of what is going on in sports medicine. The most common injuries we see are back and ankle injuries, and there's some exciting things being done in those fields. There are new therapies we can use with the athletes. These players are pushing the technology and research for treating injured athletes.

Q: What advice do you have for orthopedic and sports medicine physicians who are considering becoming a team physician?

TH: You have to enjoy the sport you are covering. You have to go into this knowing you're there to help out, but you aren't the focus of everything. You aren't going to be best friends with the players. You have to treat them as patients, and when you do that it works out for the best. ■

Uncovering the Chondrolysis Mystery: 7 Insights to Know

By Laura Miller

A recent surge in young, active patients developing chondrolysis after arthroscopic surgery has orthopedic surgeons and healthcare providers across the country concerned. Currently, a single impetus for the postoperative development of chondrolysis hasn't been isolated and in some cases patients are still experiencing pain after undergoing a total joint replacement. Surgeons and researchers across the country are working to answer the unknowns surrounding chondrolysis and developing a treatment algorithm to benefit patients.

In November, an article discussing a systematic review of the global literature available on joint chondrolysis appeared in the *Journal of Bone & Joint Surgery*. It was co-authored by leaders in chondrolysis research, including Anthony A. Romeo, MD, head of shoulder and elbow surgery at Rush University Medical Center in Chicago. "When putting this article together, we tried to uphold the highest scientific standards and unbiased evaluation of the literature in an effort to better understand this condition so we could provide a foundation for better approaches to the treatment for chondrolysis," says Dr. Romeo.

Here, the authors of this article discuss how orthopedic surgeons can potentially decrease the risk of chondrolysis for their patients as well as meet treatment challenges after chondrolysis occurs. They also discuss the implications of chondrolysis on the medical field and where research is headed in the future.

Clinical practice

1. Why chondrolysis occurs. Patients who are most at risk for developing chondrolysis are those who present with a joint injury, says Dr. Romeo. In the hip joint, the injury is often a trauma resulting in hip fracture or in association with various developmental conditions of the growth plate. In the shoulder, the condition appears to be associated with surgical management, specifically arthroscopic treatment. "We think that chondrolysis, or acute loss of the cartilage, occurs when there is some type of insult to the joint," says Dr. Romeo. "It could happen from some type of trauma, such as fracture around the joint, or some type of chemical event that occurs in the joint."

Researchers at Rush University Medical Center have identified thermal probes and the use of local anesthetic pain pumps among the potential causal factors for chondrolysis. Chondrolysis usually occurs within the first year after surgery and patients developing chondrolysis often experience abnormal levels of pain in their joint.

At present, researchers have not identified which patients might be most at risk for developing chondrolysis preoperatively. However, there are steps surgeons can take perioperatively to minimize the risk of patients developing chondrolysis or reduce damage to the joint among patients who present with chondrolysis.

"If the cartilage is exposed to an insult or in someone who already has cartilage damage or has dislocated the shoulder, that individual is likely to be at a higher risk of developing chondrolysis," says Daniel J. Solomon, MD, of Marin Orthopedics and Sports Medicine in Novato, Calif. "The entire process of surgery has a cumulative effect."

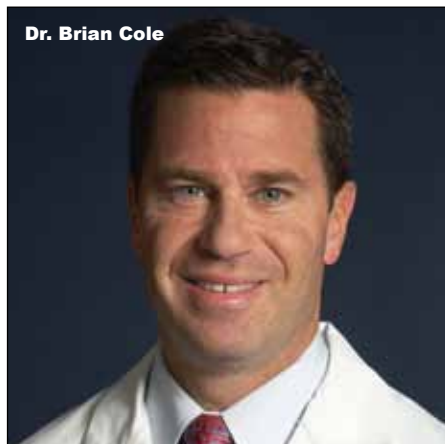
2. Minimizing the risk. The multitude of arthroscopic joint surgeries performed annually do not result in chondrolysis, which means there are certain aspects of the procedure and patient environments that may make them more or less susceptible to the condition. Current research focuses on identifying the chemicals and conditions associated with cartilage injury, which should be avoided to minimize the potential risks.

"Given the fact that we do not conclusively know the etiology of this condition, but have come to recognize various associated factors that seem to occur in combination with arthroscopic shoulder surgery, there are steps we can take to potentially minimize the chance of the condition occurring," says co-author, Brian J. Cole, MD, head of the Cartilage Restoration Center at Rush University Medical Center. "In my opinion, whenever we recommend surgery, there are some things out of our control and even though those things may not be causally related, the fact that we can minimize the risk factors our patients are potentially exposed to is a responsible way to handle surgery."

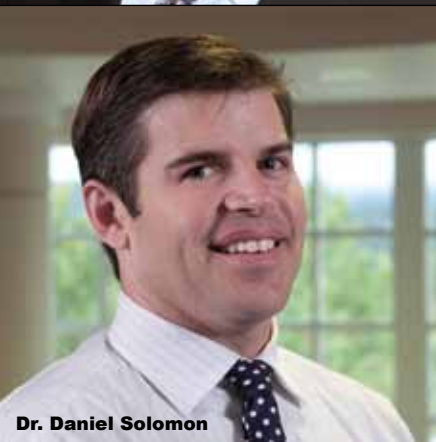
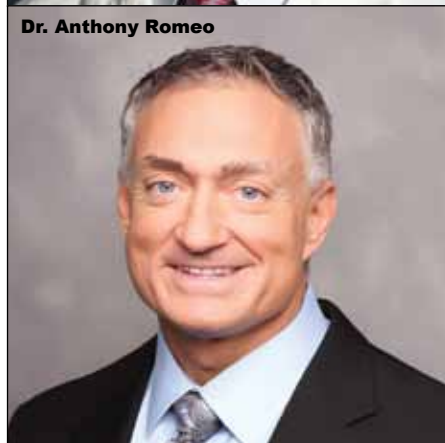
To minimize the risk of chondrolysis, Dr. Cole says surgeons can:

- Avoid over-tightening the shoulder
- Anatomically repair the shoulder as accurately as possible
- Eliminate the use of prolonged exposure to heat
- Avoid fluids that are extremes in temperature
- Minimize the chance of infection
- Position implants appropriately
- Avoid the use of high quantities of local anesthetics for long periods of time

Dr. Brian Cole



Dr. Anthony Romeo



Dr. Daniel Solomon



Dr. Maryam Navaie

“None of the chemicals that may be associated with chondrolysis are necessary for surgery,” says Dr. Romeo, so surgeons can avoid using them and still produce good outcomes with arthroscopic procedures.

“There have been some surgeons that say this problem doesn’t occur during open surgery, therefore we should stop arthroscopic forms of surgery,” says Dr. Romeo. “That would be a really strange idea for the management of these patients because we have done so many good things for patients with arthroscopic surgery.”

3. Avoiding misdiagnosis. Recent data suggests one of the factors in the increased reporting of chondrolysis could be misdiagnosis. “We really tried to emphasize the awareness of the overlap in diagnoses, especially with osteoarthritis, in our article,” says Dr. Solomon. “If you have someone at risk for osteoarthritis, they can still get chondrolysis, but the treatment options are sometimes more effective for patients with arthritis. We want to make sure that if you are treating a cartilage problem, you are treating the right cartilage problem.”

For example, cartilage transplant is more effective with osteoarthritis patients than chondrolysis patients. “With chondrolysis, the entire joint is affected, so local cartilage restoration doesn’t work so well,” says Dr. Romeo. “It’s a more severe problem and involves more complex procedures, oftentimes resulting in actual joint replacement.”

There are a few key differences for surgeons to keep in mind when diagnosing patients with chondrolysis, arthritis or another pathologic condition of articular cartilage. Chondrolysis usually occurs within the first year of surgery and has a more rapid onset than symptoms associated with arthritis. Surgeons should take a detailed patient history before making a diagnosis and look for these distinguishing factors.

“A proper diagnosis will allow us to better render an appropriate treatment for our patients,” says Dr. Cole. “For example, some of our earliest cartilage transplant procedures on the shoulder were performed on chondrolysis patients. Since the magnitude of the problem was so big, the results might be less favorable than with other treatment options. Accurately identifying chondrolysis will help our patients make informed decisions as far as proper treatment.”

4. Optimizing patient care. In the early days of chondrolysis treatment, surgeons pushed the envelope with non-replacement procedures, such as cartilage transplant, to help their patients. However, these types of procedures were often met with disappointing outcomes and many patients underwent joint replacements when all other options were exhausted. Now that surgeons’ understanding of chondrolysis is better and the diagnosis can be differentiated from arthritis, surgeons can work with their

patients on appropriate expectations for chondrolysis treatment.

“Knowing the diagnosis can help us better determine the appropriate treatment and manage the patients’ expectations,” says Dr. Cole. He takes a staged approach with chondrolysis patients beginning with the lowest risk treatment that will have the least physical impact on patients while still offering a significant potential improvement in their symptoms. Patients are offered physical therapy and injections to manage pain, and if that doesn’t work, arthroscopic debridement is an option before trying a cartilage transplant and then joint replacement.

Catching chondrolysis early and treating patients as quickly as possible could also benefit the patient. “Now that we recognize the timeline more definitively with respect to symptom onset and loss of function, surgeons who have performed an arthroscopic procedure whose patients present to them in the postoperative period with atypical complaints can order an X-ray earlier,” says Dr. Cole. “The first thing we assume when patients present with pain postoperatively isn’t an articular cartilage problem because the arthroscopic procedure is a soft tissue operation, but knowing how chondrolysis patients might present leads us to treatment earlier before the disease progresses to the end stages.”

Impact on patient care
5. Increased awareness of chondrolysis. While chondrolysis has been identified as a problem since the 1930s, the big news over the past few years has been the significant increase in patients presenting with chondrolysis in the glenohumeral joint. “The influx in chondrolysis cases in the shoulder is most likely related to the increased sophistication and management of shoulder conditions,” says Dr. Romeo. “Research suggests that the introduction of multiple factors which may be associated with the development of chondrolysis include the use of thermal energy and high concentrations of local anesthetics within the shoulder joint.”

The increase in patients presenting with chondrolysis, coupled with the intraoperative factors associated with the condition, has made it a target of medicolegal suits. “Chondrolysis is a condition that most people would agree doesn’t occur from the patient organically,” says Dr. Romeo. “It seems to occur after a surgical procedure, so people want to attach blame to the surgeon or something that happened after the procedure that led to the condition.”

However, the increased awareness has also led to more research into chondrolysis and a better understanding of how to manage the condition. “Advanced research, including our review article, will help physicians who evaluate these patients to differentiate between osteoarthritis and chondrolysis so a better treatment can be recommended,” says Dr. Cole. “These studies are

also helping surgeons understand preventative measures. As long as there is surgery, there will be risk of complications, but we would like to have enough knowledge based on prior events to improve the care we deliver to our patients.”

6. Medicolegal woes. When the term Postarthroscopic Glenohumeral Chondrolysis (PAG-CL) was coined to describe patients with chondrolysis in the shoulder joint, law firms began focusing on these patients to seek compensation for their sustained injury. Some of these lawsuits have centered on the role of local anesthetics delivered through pain pumps in the development of chondrolysis. While there is evidence that the pain pumps could be a factor in the development of chondrolysis, their role in the onset of the condition isn’t clear because there are almost always multiple other associated factors that are simultaneously present. “I don’t think we definitively know why one person will get it and why another person will not,” says Dr. Solomon.

Orthopedic surgeons are also being called on to offer expert witness opinions in chondrolysis lawsuits which takes time away from their orthopedic practices. This can be problematic, and some surgeons may decide the risk of chondrolysis and condition-related lawsuits is too great to perform arthroscopic procedures. “The implications of national litigation are having a domino effect on surgeons,” says co-author Maryam Navaie, Dr.P.H., President and Chief Executive Officer of Advanced Health Solutions, based in La Jolla, Calif. “From the physician’s perspective, every time they are going in and performing arthroscopy, they have to be concerned about the possibility of chondrolysis.”

Since an isolated cause of chondrolysis in each case is still unknown, the anxiety surrounding patients who develop chondrolysis is still relatively high.

7. Chondrolysis research. The authors of the article in *JBJS* hope to raise awareness of chondrolysis so other surgeons can use the information as a springboard for future studies on the potential causes and optimal treatment of chondrolysis. The research should first focus on identifying and separating the potential causes for chondrolysis so surgeons can isolate the specific characteristics of the condition and then develop a treatment plan according to the different etiologies present.

“It would be interesting to look at why some people develop chondrolysis and why some people don’t,” says Dr. Solomon. “If you do the same thing to 100 people, you won’t get the same results with all of them. We have to figure out why some people are at higher risk than others.” It is possible there may be genetic factors predisposing patients to develop chondrolysis and the dosage of different chemicals could also play a role in its development.

An additional field of research will be in cartilage restoration working on a biologic solution for chondrolysis treatment. “There will be continued work in the area of cartilage restoration in an effort to avoid prosthetic joint replacement solutions and we will continue to work toward biologic restoration of the cartilage,” says Dr. Romeo.

Another aspect of the research must focus on gathering large scale data across chondrolysis patients examining the various factors to drill into and decipher retrospective cohort or case-control studies. “Large scale data that

allow us to tease out the various etiologies are far better than analyzing a bunch of case reports,” says Dr. Navaie. “Another area of important but neglected research would be from a preventative stance rather than intervention. We should look at whether there are things patients may be systematically doing, such as repetitive motions that damage cartilage, which exacerbate the risk for chondrolysis. Most of our current literature focuses on what is occurring at the surgical level but there may be other factors that are putting patients at risk.” ■

5 Points on Developing a Concierge Sports Medicine Practice

By Laura Miller

Healthcare delivery is changing and while some specialists struggle to stay afloat, others remain on the innovating edge of practicing medicine. Recently, Geoffrey Connor, MD, founder of D1 Sports Medicine in Birmingham, Ala., switched his sports medicine practice from the traditional model of seeing patients as they were referred to offering “value-added” services, making his practice a one-stop shop for concierge sports medicine and sports performance. Dr. Connor discusses this transition and how his business model has given him a competitive edge heading into the future.

1. Develop a plan based on your target audience. Capturing patients can be difficult with competition from hospitals and other healthcare providers, especially when your practice is based on elective surgery during tough economic times. However, if you know what your target patient base desires, catering toward them can raise patient volume. For example, Dr. Connor’s practice focuses on treating athletic patients, many of which are adults. People from this demographic traditionally come to the office when they have a problem, but many don’t see specialty physicians on a regular basis.

“If they don’t see physicians on a regular basis, I want to give them a reason to visit my office,” he says. “We decided to focus on helping these people maintain a high level of athletic performance, not just help them after an injury. Including services geared toward peak performance and physical fitness is a place where sports medicine specialists might attract some patients who might not otherwise see a physician.”

2. Add services to add value. There are several services orthopedic and sports medicine specialists can add to their practices that will increase its value. From a medical perspective, adding extra equipment to perform procedures such as platelet-rich plasma injections or in-office fiberoptic arthroscopy gives patients additional options if they choose to pay more out-of-pocket.

There are also several non-medical services sports medicine practices can add to bring in additional patients and revenue. Dr. Connor’s practice includes equipment to perform nutritional analyses, cholesterol monitoring, C-reactive protein monitoring and the “Bod Pod” to perform body mass indexes, among other services. “These services measure patients’ performances and help them achieve their goals,” he says. “My training is in surgical reconstruction of the joints, but I can provide other services and patients will see them as an added value.”

3. Focus on cash patients. Physicians and providers have a hard time turning a profit from Medicare patients and some private insurers because reimbursement rates are so low. As a result, more specialists are trying to build a cash-based system that attracts patients who are willing to pay a little extra for these services. “The whole purpose of my business model is to convert the practice to attract the cash patient,” says Dr. Connor. “There are patients who see healthcare as something they want to improve their athletic performance.”

For cash services, his practice has issued coupons for discounts. “We have worked on some different coupons for cash-based services, whether it’s the body fat analysis, monitoring or platelet-rich plasma injections, to bring patients into our practice for non-payor based services,” he says. “Patients really respond to that.”

4. Locate in the right environment and collaborate with others. Dr. Connor built his practice overlooking a sports performance facility on one side and a football field on the other. He has developed a relationship with the sports performance facility and collaborates with professionals there to provide care for those athletes. “When people come to the practice, they are constantly confronted with athletics,” says Dr. Connor. “My collaboration with D1 Sports Training helps encourage patients to understand the values of our different services and patients want that information. We cater directly to patients who want to remain active and athletic.”



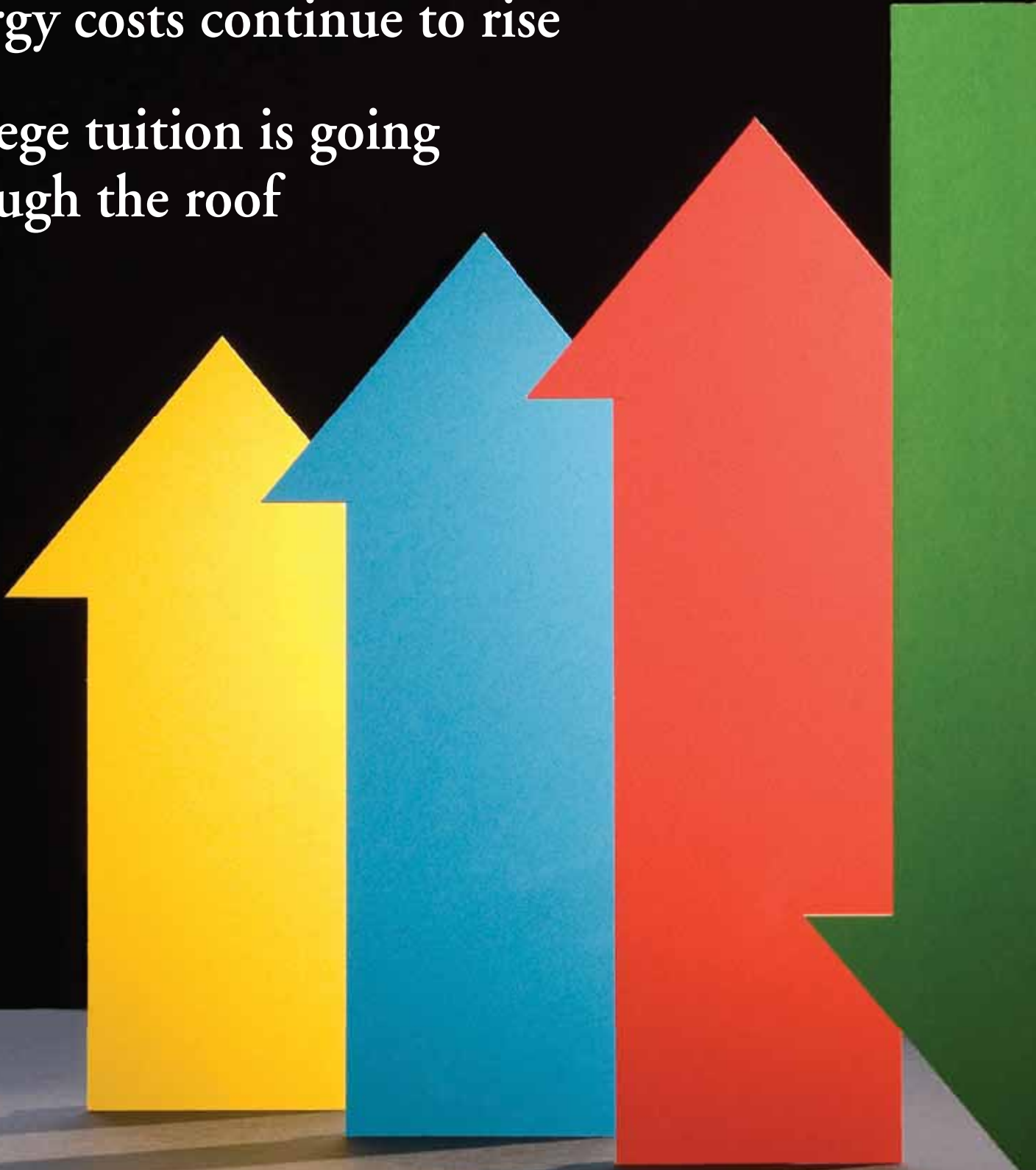
5. Employ traditional marketing tactics with a new media twist. For years, orthopedic surgeons and practices have relied upon word-of-mouth about their services to attract new patients. They also placed ads in local newspapers or on television, but these expensive methods often prove ineffective. Instead, Dr. Connor has focused on digital media to spread the word about his practice. “In this new digital world, social media has done an amazing job of replacing paid-for modalities in media and making word-of-mouth digital,” he says. “We are on Facebook, Twitter and Four Square so patients can interact with our page. We are doing unique and cutting-edge things, and the patients we are seeking are involved with these social media networks.”

The word-of-mouth digital marketing spreads even further if patients post updates while they are visiting the practice. “The person who comes in with 500 Twitter followers might Tweet that they are here and spending time in the Bod Pod and that’s like free advertising,” says Dr. Connor. “This type of post reaches a lot more people than a generalized knee advertisement. We’ve learned to tune out our radio and TV ads, but we listen to our best friends.” ■

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NASS Next Year: Dr. Michael Heggeness on Goals & Challenges for 2012

By Laura Miller

Michael Heggeness, MD, director of the spine surgery fellowship program at Baylor Clinic in Houston, was recently named the 2011-2012 president of the North American Spine Society. In this role, he will be building upon the efforts of previous leaders to strengthen NASS's mission of fostering advancement in spine care and advocating for the interests of spine specialists and patients in Washington, D.C.

"Right now, NASS is a place where one goes to teach and learn about things in spine," says Dr. Heggeness. "We have our annual meeting where people want to present their research and hear about cutting-edge opportunities in spine care. We also have *The Spine Journal* and *Spine Line* as a medium for the exchange of information. I'm interested in seeing that these things grow over the next few years. We're lucky to have an absolutely astonishing group of people donating a huge amount of time and energy to keep NASS going forward."

During his time as president of NASS, Dr. Heggeness will focus on promoting two major goals:

- More basic science studies in spine
- Larger international focus

"I want to promote NASS as the primary place where we can exchange basic science about the spine. I'd like to see more discussion and research on topics such as molecular genetics and bioengineering," he says. "I'm also looking for more collaborative efforts with spine specialists and societies abroad. Those initiatives include co-sponsored meetings and other activities that involve our international colleagues."

Looking into the future, Dr. Heggeness sees biology becoming a bigger part of treating spine patients. "In the next five years, some of the new biology will eventually have a much larger influence in the way we treat patients," he says. "We'll be using new molecular techniques to help our patients get better."

However, there are still several challenges spine surgeons will face over the next year in both clinical practice and research. Dr. Heggeness discusses three major challenges and how they will impact spine care going forward.

1. Paying for healthcare. One of the biggest current challenges for medical professionals is figuring out how people are going to pay for their healthcare. Uncertainty with the Patient Protection and Affordable Care Act — what parts will be repealed and implemented — makes it difficult to predict what the future holds for healthcare providers. Reimbursement is declining for all specialists, and spine surgeons are no exception. However, with the healthcare landscape in flux, surgeons and professional organizations have the opportunity to contribute to the new emerging healthcare structure.

"Right now, we are looking at how the diminishing pieces of the healthcare pie are going to be distributed among the different parties involved," says Dr. Heggeness. "NASS will continue to try to contribute thoughtfully and reasonably as arguments come along."

2. Implementing evidence-based medicine. As with all medical specialties, spine research is now focused more on providing strong evidence-based research for the development of treatment guidelines and justifying reimbursement. Unlike some other specialties, spine research hasn't been well-funded. Therefore, strong evidence-based studies are lacking. "Evidence-based medicine means a very structured look at the research and creating definitive guidelines," says Dr. Heggeness. "We have the challenge of obtaining the evidence to guide our treatments."

He notes that in the past, one of the biggest challenges was disseminating the information associated with new research. Technology such as the Internet and online professional journals has fixed that problem, but the research still needs to be stronger. "Research could be a lot better if we had more funding from impartial sources," Dr. Heggeness says.



3. Funding research. Research has always been an important part of spine care, but is even more important now in finding and defending appropriate treatment pathways. While the depth of spine research is beginning to broaden, surgeons struggle to find non-industry funding for their projects. "Those of us who devote time to clinical research are suffering, like all musculoskeletal specialists are suffering, from a lack of research funding," Dr. Heggeness says. "If you look at the frequency and the amount of human suffering and disability due to musculoskeletal injury and disease, the amount of funding provided by the National Institute of Health is ridiculously low."

As a result, many spine surgeons have accepted funding from spine device companies to conduct research trials, and when industry members sponsor research there is the potential for bias in outcomes reporting. "There are good reasons to be alert to bias from industry-sponsored studies, but in many cases industry is the only funding source for spine research," he says. "We have huge problems finding money to fund the very important research projects that are taking place, and that is a real concern for us because the opportunity to actually study effective treatment for back pain or fracture healing too often just isn't there." ■

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Where Spine Research is Headed: 5 Points From Dr. Frank Phillips

By Laura Miller

Spine surgeons are faced with several roadblocks to providing care in today's healthcare environment. Frank Phillips, MD, a spine surgeon at Midwest Orthopaedics at Rush in Chicago, says research and innovation could lift some of these roadblocks, but clinical application of the most cutting-edge treatment is challenging. He discusses the importance of research for spine surgeons, difficulties associated with conducting that research and five prominent areas where surgeons are working to improve spine care.

Why research and innovation are important

Payors are making it increasingly difficult for spine surgeons to provide the best care for their patients by denying elective procedures in non-traumatic situations. Insurance companies rely on strict guidelines, such as the Milliman Guidelines, to dictate when a procedure is "medically necessary" and will be approved for reimbursement. These guidelines may exclude patients who could benefit from surgical intervention justified by evidence-based research.

"I spend hours each week dealing with denials for generally well-accepted, evidence-based procedures," says Dr. Phillips. "The development of these guidelines for payors typically lacks transparency, has little or no spinal specialist input and selectively uses studies to approve or deny care. It becomes a runaround for patients to receive coverage. It becomes frustrating and time consuming to deal with these issues."

There have been numerous instances where Dr. Phillips hasn't been able to connect with a hard to reach case reviewer to approve the procedure until the day before the scheduled surgery, and a denial at that point is emotionally stressful and disruptive for the patient. "We see it over and over again; it's become a part of every day life for spine surgeons," he says. "It's frustrating for the physician and really devastating for the patient."

The key to ensuring coverage for necessary spine procedures lies within evidence-based medicine. "The best we can do is provide compelling data showing what we do makes a difference in patients' lives," says Dr. Phillips. "As we collect more data and that data supports the effectiveness of what we do, it will become harder for payors to deny it."

What to expect from cutting-edge research in the near future

Research and development in spine surgery moved quickly over the past decade, but environmental forces will slow this over the next several years. Cost pressures from the healthcare system, increased regulation from the FDA and intense scrutiny on the relationship between spine surgeons and device companies will all hinder future innovation. Here are five areas of prominent spine surgery research and where they are headed in the near future:

1. Biological solutions. For the moment, spine surgeons are more hesitant to spend time researching and refining biologic solutions for spinal fusion because of the controversy surrounding rhBMP-2. Earlier this year, a group of surgeons led by Eugene Carragee, MD, a spine surgeon at Stanford University Medical Center, raised questions about the integrity of the original study data released on the only FDA-approved recombinant bone morphogenetic protein product for spinal fusion, Infuse. Many of the surgeons who participated in the industry-sponsored study received compensation from Medtronic (although not necessarily related to the study), the company that produces Infuse, which Dr. Carragee and his colleagues suggest could have influenced the interpretation of outcomes data. Since then, several spine surgeons have voiced their opinions about using Infuse in their practice: some continue rigorous application while others scaled back or ceased their use.

"The field of biologics is going through a tumultuous time with the Infuse controversy, which is putting spine surgeons in an unfortunate position," says Dr. Phillips. "It seems Infuse has its place, but the negative information about the product, largely based on opinion, makes it hard to use on patients even when it may be the best solution."



As a result of this controversy, several surgeons and researchers are now looking at alternative biologics that may be able to promote fusion. "There are a lot of different molecules out there but there aren't any other products that have had as definitive results as Infuse," he says. "In the near future, we are going to see a lot of bone graft extenders, but probably not any revolutionary products in the field."

2. Stem cell use. In addition to synthetic biologic solutions, some researchers are also examining the use of stem cells for spine fusion. However, at the moment there has been little data to support or refute their effectiveness. "Although basic science studies support their effectiveness, there are few clinical studies, which we need, on the use of stem cells in spine surgery," Dr. Phillips says. "In the future, we'll see data about whether stem cells improve fusion rates and clinical outcomes."

3. Artificial disc replacement. While lumbar disc replacements have been used sparingly in recent years, cervical disc replacement seems as though it's here to stay, says Dr. Phillips. The indications for cervical spine surgery are less contentious than those in the lumbar spine, making cervical disc replacement easier to justify. Multiple FDA trials show excellent results with artificial cervical discs through at least five years.

"More payors are getting on board with artificial cervical disc replacement because it's hard to argue with the data," he says. "There will be innovation in cervical disc arthroplasty, but the regulatory process remains cumbersome. The discs that are out there now will most likely continue to show good results, but it is extremely expensive and time consuming to bring newer designs of disc replacements to the market given the regulatory hurdles. There are theoretically better artificial disc designs out there, but it will be years before we see them on the market in the United States."

At the moment, the number one most used artificial cervical disc in Germany hasn't even begun FDA trials for approval in the United States because of these issues even though the company is U.S.-based.

4. Regenerating and healing injured discs. There has been significant research in regenerating and healing damaged discs, but surgeons are still a long way from applying that research to patients. "The holy grail for spine research is regenerating and healing injured or degenerated discs," says Dr. Phillips. "Even if basic science shows a particular growth factor injection will regenerate the disc, researchers are still unsure whether that would alleviate pain in patients. There is also a question as to whether the effects of a single growth factor injection would last for an extended period of time."

5. Gene therapy. Gene therapy has been studied for disc regeneration and could offer a longer-term solution for patients because it influences disc metabolism. However, even if gene therapy is found effective, Dr. Phillips says most patients with painful disc degeneration would be unlikely candidates for the procedure given the clinical and ethical challenges with the use of gene therapy even to treat lethal conditions. "It's quite a ways away from having any mainstream clinical spinal application," he says. ■

Importance of Minimally Invasive Spine Surgery in the ASC Setting: Q&A With Dr. John Pelozo

By Rob Kurtz

John H. Pelozo, MD, is an orthopedic spine surgeon, founder and medical director of the Center for Spine Care and founding physician partner of the Institute for Minimally Invasive Surgery in Dallas, which was recently founded through a partnership between Meridian Surgical Partners and local physicians. He is a leading expert in minimally invasive spine surgery and has helped launch several minimally invasive spine surgery technologies. He is an investigator/researcher in FDA trials, such as MAVERICK total disc replacement, and holds multiple spinal technology patents. He is a spine consultant to the U.S. Ski Team and a member of numerous national and international medical organizations.

Q: Before we get into why you thought it was the right time to open a new ambulatory surgery center, can you describe your view of the current model of healthcare delivery in this country and how we got here?

Dr. John Pelozo: The model of healthcare delivery is changing, and it probably won't be the same again. The old days are over, no matter what happens with the [Affordable Care Act]. Healthcare is now being driven by proving improvement in care and a huge drive to cut costs. In order to give a value proposition to somebody to make a decision on healthcare, you need to provide clinical outcomes and costs. You need both; you can't have just one or the other because you can't determine value.

There are several strategies in place in response to these changes. One is an accountable care organization. This is a vertically integrated medical system designed to deliver all medical care across all medical specialties in one location. They depend on efficient centralized administration, contracting, marketing, reduced errors and redundancies, economies of scale and electronic medical records. These ACOs have several problems. No one has ever designed a system that could manage all the different fields of medicine with their inherent complexities and distinctly different pathologies and treatments. Biologic systems respond to interventions differently than mechanical systems. In addition, people have different priorities, goals, and risk tolerance at different phases of life. People also change their minds so that modeling healthcare can be drastically different than modeling an engineering problem. Most people seeking healthcare at any moment in time do not need the resources of these large, expensive, bureaucratic organizations. So far, very few ACO trial models have

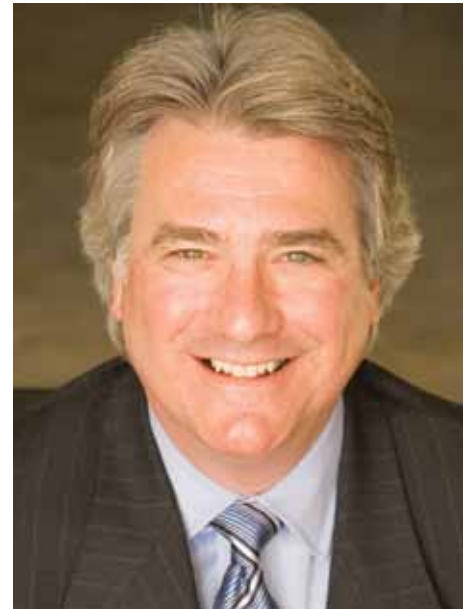
avoided bankruptcy. However, since the ACOs are integral to the healthcare plan, they will probably be heavily subsidized by the U.S. government at astronomical cost.

Another feature of most of these plans is a capitation payment system. In this payment method, providers are given a set fee per enrolled member (patient) per month at the beginning of a time period (e.g., monthly). The providers are incentivized to do as much nothing as possible because every intervention is a cost that gets deducted from the provider's monthly fee. Costs are controlled by restricting care at the provider level. This was tried in the 1990s without much success because educated healthcare consumers would not buy these plans.

These strategies have gatekeepers in position to determine when and where patients go for their care. These are mostly primary care physicians but they can be physician assistants or nurse practitioners. The problem is that nobody knows enough about all of the fields of medicine to really perform that role well. This is not a knock on PCPs. I know spine. I don't know family practice, general surgery, cardiac surgery or cardiology. For me to make decision in those fields wouldn't be very helpful or effective. So I think that's a reason that model broke down.

Presently, the players are hospitals, insurers, employers and providers. The hospital strategy is to merge and get bigger to control patient access. They're merging huge systems and hospitals, they're buying doctor practices and they're trying to drive patients into their systems in order to exclude non-affiliated providers from their systems and patients. They are trying to build local monopolies in order to gain leverage in contracting with insurers, providers and vendors. They think they're going to get economies of scales and efficiencies and keep their hospital beds full. But the problem is that hospitals have huge overhead costs. They have legacy costs, land costs, facility costs, overlapping administrative and clinical staff costs. They can [make a lot of] cuts but they can't get rid of all of that overhead. Most of their cuts will come at the expense of providers and vendors so they will cannibalize their own product. They will still be large, inefficient dinosaurs that monopolize everything through their networks but still be dependent on keeping expensive beds full.

The insurers are trying to expand their market share. They're merging with insurance compa-



nies or healthcare facilities or systems. They're buying medical practices and providers. They're even talking about cooperative entities with healthcare systems to share risks. We'll see how that works out.

The employers are probably just sitting on the sideline to see how it all shakes out to get the best price they can.

Q: What about the government?

JP: Government is the biggest player of all. What government can do is legislate their competition out of business. They can do it by denying a healthcare entity the ability to compete or they'll just require so many mandates that they go bankrupt. You're seeing a lot of that in the healthcare bill. The goal is eventually a single payor, government run and regulated healthcare system. In order to cut costs, the strategy is to ration care — that's the only way they're going to be able to do it. They can ration it through regulation, such as when the FDA just denies an implant, a drug or procedure. The government can do it through evidence-based medicine. They can manipulate statistics and game the system, in order to determine that an intervention doesn't work well enough. Even when they have to acknowledge that something works, they'll just say it's too expensive and not cost effective.

Q: How are physicians viewing these developments?

JP: From a doctor's perspective, there's a lot of doom and gloom out there when they consider that they may be an employee of the govern-

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ment, a hospital system or maybe an insurance company. Doctors see all of their options being eliminated and they're going to be told how to practice medicine by someone who made an algorithm [to determine how to provide care]. They're going to be told what to do by some bureaucrat who is totally unaccountable to the patient.

One of the big things about medicine is that every patient is different. A weakness of evidence-based medicine with a randomized prospective study is that the conclusions often do not apply to specific clinical situations. Without experience, the decisions that come out of an algorithm based on evidence-based medicine don't work. It is essential to have a robust knowledge of the specific medical literature, but to actually do a procedure or surgery you need to know the patient's specific diagnosis, what they're comfortable with in terms of risk and what the doctor can actually do because people have different skill sets. After an intervention, a physician must manage the patient effectively. You have to really take care of people, and that's one on one. I don't think you can systemize that to just one size fits all. It's not very effective.

Q: How does all of this affect patients?

JP: I think people appreciate when you're with them, you talk about all of their options and then you can take care of them before surgery, during the surgery and then particularly afterwards. You don't get that with industrial-type medicine.

When it comes to healthcare, patients want to remain the primary decision makers along with their physicians. They do not want government or insurers to decide the quality or quantity of care they receive. Without the ability

to deliver medical care, we will get no innovation on devices, techniques or drugs because there won't be a way to commercialize them. There will be no research and development and medicine will decline like you see in other parts of the world that have embraced either socialized medicine or some capitation system.

Q: Given this outlook on healthcare, as the marketplace is shifting to these big organizations, and considering the economy is struggling and development of de novo surgery centers has flattened, why would you still decide to proceed with building an ASC now?

JP: Eighty percent of spine surgery is done in the hospital now. For years we were bound to the hospital because open spine surgery had significant dissections, instrumentation and blood loss. Patients required significant anesthetics, particularly pain management postoperatively, and also a lot of rehabilitation. Only about 20 percent of spine is done in an outpatient setting. However, we have been performing the majority of our spine surgery for years as same-day or overnight admission. All of these cases can now be done in an ambulatory setting. The device manufacturers have even estimated that within the next 10 years, 80 percent of spine surgery will be done outpatient in an ambulatory setting versus only 20 percent in the hospital. We have positioned our center to provide that care. We participate in evidence-based medicine and record patient clinical outcomes on all of our surgery as if they were in an FDA study. In addition to our ability to do clinical outcomes research, we can control our costs and also follow our costs in order to show that we are the best option for spine care. We're in the position to offer these high quality patient outcomes in a convenient,



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Q: Is this approach catching the attention of payors at all?

JP: We've had some interest by people in the insurance industry that if we prove this concept, and we can cut the cost and still provide the high quality, based on evidence-based medicine, and provide a concierge patient experience, they're going to be very interested in bringing their patients to our center. We are cooperating with the insurers because we think we add value. That's why we decided to open this center. We think that after about 15 years of minimally invasive experience that we can actually pull it off.

We're in a unique position to monitor this data — patient satisfaction, outcome and cost. We're in a great position to compete with anyone. We're already proving this concept works, and we're excited to take this to insurers. It is estimated that an ASC can provide a procedure at 65 percent of the cost of a hospital. We can go to an employer and set up a program for them. If the FDA doesn't approve a particular technique or the insurer says they're not willing to cover it, we can provide that care to that [patient] at a reasonable cost and then they have to determine if it's worth it.

Q: What is an example of a technique not approved by the FDA or covered by insurers that patients would be willing to consider paying for out of pocket?

JP: An example would be lumbar disc replacement. A recent publication on the MAVERICK disc replacement shows it's superior to minimally invasive fusion at every point of time postoperatively. The FDA hasn't approved this specific disc even though it was the largest prospective, randomized trial with level I data in the history of spine surgery. It is often difficult to even get the FDA-approved lumbar disc replacements approved for patients because some insurers still have a negative view of lumbar disc replacement as a procedure, but the demand by patients for this technology is tremendous. At an ASC we have the flexibility to provide a reasonable, package cash price to those patients interested in paying out of pocket for lumbar disc replacement procedures.

Q: The Institute for Minimally Invasive Surgery is a joint venture with Meridian Surgical Partners. Why partner with a management and development company rather than opening the facility independently?

JP: I know a lot about spine but I only know a little bit about business. One thing about knowing just a little bit is you can really get hurt ... bad. You need a partner that's done it before. The complexity of putting [an ASC] together is significant. You want somebody with a track record who knows how to do it. You're talking about buying real estate, an architect to design it, contractors to build it and somebody to manage it — and that's

hiring staff, managing staff, human resources, buying equipment. Meridian gets great prices on everything we bring in here and that's helping keep our costs down. They manage the facility, particularly operations. I need to focus on what I know and not try to manage something that's as complex of a business entity as this.

Q: Did you consider a hospital partner?

JP: The problem with the hospitals is in order to get them involved, they generally want 50 percent of your ownership. They don't provide enough to get that, frankly, in my opinion.

Q: What types of procedures are you performing in the ASC now and do you anticipate performing other procedures in the future?

JP: As minimally invasive surgery has evolved, we started by doing the simplest things and then we just expanded. One of the nice things about my career is we've worked really closely with engineers. The surgeons and engineers would collaborate to make better tools, and as we made better tools we were able to do more type of surgery. We used to say that minimally invasive doesn't mean minimally effective. You had to be able to accomplish the goal of the surgery you would do open with minimally invasive tools.

We started with discectomies, and now we're starting to work through endoscopic tools with fiberoptic scopes, so a 7 mm tube is one way we can do a discectomy. Then we could do partial laminectomies through a tube, and a multi-level surgery through a single portal, and bilateral surgery with a single portal and multi-level bilateral surgery through a single portal. It just got better as our tools improved.

Then we started putting metal into the spine. We put in pedicle screws. We just did a percutaneous thoracic case. Now in the outpatient space you will see TLIFs, PLIFs, posterior percutaneous screw fixation, facet screws and also DLIF or XLIF procedure through the side through a tube backed up with posterior instrumentation.

We have in our facility an O-arm [Surgical Imaging System from Medtronic], so we have intraoperative CT navigation. That's just lumbar spine. In the cervical spine, we have done several posterior minimally invasive foraminotomies and discectomies. We can do anterior surgical fusions and cervical disc replacements in an outpatient setting.

Eventually we're going to do anterior surgery and we'll be doing anterior lumbar disc replacements [in the ASC].

We're pretty confident we're going to be doing anything except deformity. In terms of degenerative lumbar deformity, we are doing that with minimally invasive techniques now in the hospital. That's probably the last thing we'll conquer as outpatient. ■

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Now is a Great Time to be a Physician: Q&A With Dr. John Caruso on Physician Involvement in Healthcare Changes

By Laura Miller

Despite the uncertainty associated with today's healthcare system, John Caruso, MD, a neurosurgeon with Parkway Neuroscience & Spine Institute in Hagerstown, Md., believes that now is a great time to be practicing medicine. His optimistic outlook focuses on the potential for positive change and physicians' ability to drive that change. He has decided to become involved in affecting positive change in the healthcare system and he encourages other medical professionals to do the same.

"When the healthcare environment gets rough, you can't put your head in the sand," says Dr. Caruso. "We're seeing two different scenarios play out on the micro and macro levels of healthcare: People are either praying things don't change or they are preparing for the worst. Surgeons need to take steps depending on their unique and personal perspective to position themselves for success. These steps include taking employment at a hospital, giving up cases that aren't profitable or cutting back practice staff. The decisions surgeons must make have huge implications for themselves, their employees and their patients."

Here, Dr. Caruso discusses the biggest challenges and opportunities for surgeons in today's healthcare environment.

Q: What are the changes in the healthcare system that spine surgeons should be most concerned with right now?

Dr. John Caruso: In January, we may likely see reimbursement going down, which means there will be access to care issues. Surgeons need to consider how they are going to deal with the reimbursement decline. Are you going to get involved in cutting out some of the fat? Are you going to play a part in making changes to the system? Physicians need to buck up and say "Yes, I will be involved in cutting costs but will fight to maintain healthcare quality and accessibility."

In cutting costs, we also have to think about whether the new equipment or expensive implant will work better for the patient. New technology must be able to deliver outcomes proving it is better, which sounds great, but it isn't so easy to obtain this type of information. The other big thing physicians need to advocate for is tort reform which effects how we practice care delivery. We need to challenge some of the influences that effect how we practice. Medicine as an industry has been propped up by the economy but now the economies are changing, and physicians must have a seat at the table to champion their causes and their patients' causes.

Q: Most surgeons would agree that medical professionals should be part of the overhaul of the healthcare system, but many don't become involved in advocacy efforts. What is holding them back?

JC: Physicians go into medicine because they have an altruistic drive to help people. What has discouraged physicians from becoming more active is they don't see the strength they have. Our strength is in what we do: taking care of people. We aren't looking at the numbers and making decisions based on profitability. If we look at ourselves collectively, we have market mover strength and there are things we can do to maximize that position: get engaged, improve overlap in redundancy, integrate with other providers and show payors what we can achieve for patients.

American medicine has disengaged surgeons from our non-surgical colleagues and made it hard for us to get things done. We need to think about how we can use different business models to improve our costs by leveraging what we do: provide good quality care. We need to get back to the concept that healthcare isn't a right; it's a privilege. There are people dying from

lack of healthcare all around the world. We have a great concept that can improve the healthcare system if we become engaged in it. Now is the time to step up and form relationships with different stakeholders in the healthcare system to provide better patient outcomes and improve how we practice.

Q: It's a challenging time for surgeons right now because the healthcare system is in a constant state of change. How does all this uncertainty impact spine surgeons?

JC: It has both positive and negative impacts, but I really believe this is a great time to be a physician because we have the chance to take back the healthcare system. We've been held hostage by a third-party payor system and lost control of decisions at a hospital level. The strategy to overcome these unique challenges encompasses not only what will happen at a local or regional level, but also what is happening at the national level. The market will always dictate the healthcare industry, and the question you have to ask yourself is: Are you prepared as a physician or physician group to become part of the answers to these challenges?

Q: In your experience, what concrete things can spine surgeons do to become part of the 'answer' for these challenges?

JC: One of the most important things we can do is prepare appropriately for the future. Physicians must understand that medicine is a business. If we want to practice the way we want to practice, we have to adopt a business mindset. You cannot practice medicine without understanding that you are in the business of medicine. As I've tried to grow my practice, I found that you have to have a good business understanding and your business models have to be flexible. There is more to being profitable than just working harder and seeing more patients to pay the bills.

Personally, I am looking to apply the idea of centers of excellence to spine care and musculoskeletal care. That doesn't mean just providing all the standard spine care practices under one roof; we are talking about truly trying to improve our group by our physicians helping each other to improve how we take care of our patients. We have to be able to use our position of strength to help each other out and conduct a business that will most benefit our patients. I really encourage physicians to find ways to enter the discussion about healthcare improvements and not rely on legislative or administrative solutions. We have to have faith in ourselves as physicians and trust that we will champion our patients over all others.

Q: How can surgeons begin engaging with their colleagues and fellow healthcare professionals to affect change in the healthcare system?

JC: Physician engagement involves changing the dynamics of how you practice and think. As physicians, we rarely participate in the legislative side of organized medicine, but you have to spend money on politically active associations. Surgeons should also engage with state and national societies and connect with both academic and clinical private practice. Healthcare reform changes are being thrust upon us now and it'll either unify or fracture us further. My premise is that we have the power to make things happen if we work collectively. Spine surgeons and musculoskeletal specialists all have the same challenges, so that should bring us together. We must improve the cost effectiveness of how we practice but not relinquish access or quality. ■



101 Hospitals With Great Spine & Neurosurgery Programs (continued from page 1)

Arkansas Surgical Hospital (North Little Rock, Ark.). The physician-owned Arkansas Surgical Hospital offers several different spine surgeries, including lumbar laminectomies, posterior lumbar interbody fusions and other minimally invasive procedures.

Aultman Hospital (Canton, Ohio). Aultman Hospital's Neuroscience Center of Excellence features a neurosurgery program with advanced diagnostic equipment and diagnostic procedures and was the first to introduce intracranial doppler studies.

Aurora BayCare Medical Center (Green Bay, Wis.). Aurora BayCare Medical Center, the largest physician-owned hospital in north-east Wisconsin, specializes in the treatment of disorders and diseases of the cervical, thoracic and lumbar spine, including spinal deformities, fractures and tumors.

Aurora St. Luke's Medical Center (Milwaukee). Spine experts at Aurora St. Luke's Medical Center specialize in several spine conditions, including herniated discs, lumbar stenosis and spinal tumors.

Barnes-Jewish Hospital (St. Louis). The Barnes-Jewish & Washington University Spine Center is one of the largest clinical spine care practices in the United States, and Washington University neurosurgeon Neill Wright, MD, developed translaminar fixation, a cervical spine surgery, at Barnes-Jewish Hospital.

Beaumont Hospital (Royal Oak, Mich.). Mick Perez-Cruet, MD, is the chief of minimally invasive spine surgery at Beaumont and is internationally renowned for pioneering treatments of spinal disorders.

Beebe Medical Center (Lewes, Del.). Beebe Medical Center has eight board-certified orthopedic surgeons that perform more than 300 spine surgeries every year in Delaware.

Beth Israel Deaconess Medical Center (Boston). Beth Israel Deaconess Medical Center recently published a study that found spine surgeons can save more than \$126 million in surgery costs each year with an intraoperative waste awareness program.

Black Hills Surgical Hospital (Rapid City, S.D.). Black Hills Surgical Hospital offers neurosurgical treatments, including cervical and lumbar microdiscectomy, endoscopic spinal fusion and microsurgery.

Bon Secours St. Francis Hospital (Charleston, S.C.). Neurosurgeons at Bon Secours St. Francis Hospital use some of the most current technology, such as the O-Arm

Imaging System and the CyberKnife system for stereotactic radiosurgery.

Brigham and Women's Hospital (Boston). Harvey Cushing, MD, whom many consider to be the father of neurosurgery, was the surgeon-in-chief when Brigham and Women's Hospital first opened in 1913 (then known as Peter Bent Brigham Hospital).

Cedars-Sinai Medical Center (Los Angeles). The Cedars-Sinai Department of Neurosurgery offers a wide array of services, including treatment of spinal cord dysraphia and spinal deformities.

Central DuPage Hospital (Winfield, Ill.). The Neurosciences Institute at Central DuPage Hospital offers several different treatment options for spine care, such as synergy neurostimulation, spinal cord simulators and kyphoplasty.

The Christ Hospital (Cincinnati). The Christ Hospital's Spine Institute employs new equipment and commonly performs several advanced spinal interbody fusion procedures.

Cleveland Clinic. The Cleveland Clinic Neurological Institute has several laboratories and research centers specifically designed for neurosurgical research — including its Spine Research Laboratory and the Mellen Center for Multiple Sclerosis.

Cookeville (Tenn.) Regional Medical Center. Cookeville Regional Medical Center's Spine Center houses board-certified neurosurgeons who perform minimally invasive treatment for spinal fractures.

CoxHealth (Springfield, Mo.). CoxHealth has the largest group of neurosurgeons in Missouri and northern Arkansas and was recently named a neuroscience center of excellence.

Dartmouth-Hitchcock Medical Center (Lebanon, N.H.). Dartmouth-Hitchcock Medical Center's Spine Center was featured in a multi-year SPORT study examining surgical and non-surgical spine care.

Doctors Hospital at Renaissance (Edinburg, Texas). Doctors Hospital at Renaissance is one of the largest physician-owned hospitals in the country, and its spine and neurosurgical services are also highly ranked among POHs.

Doctors Hospital of Sarasota (Fla.). Doctors Hospital of Sarasota offers a wide range of neurosurgical and spine procedures and houses highly experienced neurosurgeons.

Duke University Hospital (Durham, N.C.). Duke University Hospital has several special clinical neurosurgery programs, including its Center for Functional and Stereotactic Neurosurgery.

East Cooper Medical Center (Mount Pleasant, S.C.). East Cooper Medical Center spine surgeons specialize in minimally invasive spine procedures.

Eastern Idaho Regional Medical Center (Idaho Falls, Idaho). Neurosurgeons at Eastern Idaho Regional Medical Center use the StealthStation Navigation for precise implant placement.

Einstein Medical Center (Philadelphia). The surgeons at Einstein Medical Center often treat patients with herniated discs, spinal stenosis, spinal tumors, spinal cord injury and spinal trauma.

Ellis Hospital (Schenectady, N.Y.). Ellis Hospital's neurosurgery team specializes in the treatment of back pain, complex spine disorders, spinal stenosis and several other conditions.

Emory University Orthopaedics & Spine Hospital (Atlanta). Part of the award-winning Emory University Healthcare, Emory University Orthopaedics & Spine Hospital specializes in several surgical services, such as spinal fusions, and offers all of the attributes of the major university medical center.

Evanston (Ill.) Hospital. Evanston Hospital, part of NorthShore University HealthSystem, has several renowned neurosurgeons.

Florida Hospital (Orlando). Florida Hospital in Orlando treats among the most neuroscience patients of any hospital system in the country.

Forrest General Hospital (Hattiesburg, Miss.). Forrest General Hospital has been designated as a Neuroscience Center of Excellence.

Forsyth Medical Center (Winston-Salem, N.C.). Forsyth's fellowship-trained neurosurgeons use the latest technology for several treatments, including degenerative diseases and vertebral compression fractures.

Fort Walton Beach (Fla.) Medical Center. Fort Walton Beach Medical Center is considered to be one of the top hospitals in Florida for spinal surgeries and spinal fusions.

Gaston Memorial Hospital (Gastonia, N.C.). Part of CaroMont Health, Gaston Memorial Hospital offers a continuum-based approach to spinal cord care.

Geisinger Medical Center (Danville, Pa.). Geisinger Medical Center houses fellowship-trained neurosurgical oncologists and has specialized pediatric neurosurgical procedures.

Gundersen Lutheran Medical Center (La Crosse, Wis.). Gundersen Lutheran neurosurgeons offer several modern spine surgeries, such as disc arthroplasty and stereotactic radiosurgery.

Henry Ford Hospital (Detroit). Henry Ford Hospital was the first hospital in Michigan to provide minimally invasive spine surgery and the first hospital in the United States to provide radiosurgery for spine cancer.

Hospital for Special Surgery (New York). The Hospital for Special Surgery has the Integrated Spine Research Program that includes surgical and non-surgical spine specialists.

The Hospital for Spinal Surgery (Nashville, Tenn.). The Hospital for Spinal Surgery, part of Saint Thomas Health, offers nine different spine services, such as lumbar fusions and minimally invasive discectomies.

Hospital of the University of Pennsylvania (Philadelphia). Hospital of the University of Pennsylvania, part of Penn Medicine, offers more than 50 neurosurgical treatments and services, ranging from its Gamma Knife Center to its Neuromuscular Disorders Program.

Indiana University Health Methodist Hospital (Indianapolis). In 2010, IU Health neurosurgeons performed more than 2,200 spine surgeries and craniotomies combined.

Jackson Memorial Hospital (Miami). Jackson Memorial Hospital works in conjunction with the University of Miami Spine Institute.

JFK Medical Center (Edison, N.J.). Former North American Spine Society president, Gregory Przybylski, MD, is the director of neurosurgery at the New Jersey Neuroscience Institute at JFK Medical Center.

John Muir Medical Center (Walnut Creek, Calif.). John Muir Medical Center was one of the first medical centers in the country to offer stereotactic radiosurgery to treat certain types of brain and spine tumors in 2004.

Johns Hopkins Hospital (Baltimore). Johns Hopkins was the first hospital to pioneer a neurological critical care unit and performs some of the newest and most in-depth neurosurgical procedures.

LewisGale Medical Center (Salem, Va.). Preventing and providing relief of back pain and spinal disorders is one of LewisGale Medical Center's main specialties.

Massachusetts General Hospital (Boston). Massachusetts General Hospital's Department of Neurosurgery has 12 different subspecialties, and its Spine and Peripheral Nerve Center has several world-renowned spine surgeons.

Mayo Clinic (Rochester, Minn.). Mayo Clinic has neurosurgeons at the three Mayo Clinic locations that perform several thousand neurosurgical procedures per year.

Medical University of South Carolina Health (Charleston, S.C.). MUSC Health

has a neurosciences department that encompasses nine different areas, including its Spine Center and MUSC Brain & Spine Tumor Program.

Mercy Hospital (Miami). Mercy's CyberKnife Institute uses the latest CyberKnife technology to treat surgical spinal tumor cases, among others.

The Methodist Hospital (Houston). Michael Heggeness, MD, who has hospital privileges with Methodist, is the 2011-12 president of the North American Spine Society.

Metro Health Hospital (Wyoming, Mich.). Metro Health Hospital is the first hospital in Michigan to offer the Renaissance Guided Spine Surgery system, which enables neurosurgeons to provide safer and more accurate spine surgeries.

Mission Hospital (Asheville, N.C.). Mission Hospital's Neurosciences Institute encompasses the Spine Center, which offers new technology for treating spinal disorders.

Morton Plant Hospital (Clearwater, Fla.). Morton Plant Hospital was the first hospital on the west coast of Florida to have a complete stereotaxy program for accurate localization and excision of brain and spinal cord lesions.

Mount Sinai Medical Center (Miami). Mount Sinai Medical Center in Miami offers a range of minimally-invasive spinal surgeries, including AxialLIF, kyphoplasty and disc replacements.

Mount Sinai Medical Center (New York). New York's Mount Sinai Medical Center has a neurosurgical spine program with specialists who possess expertise in spinal trauma, disorders, tumors and minimally invasive surgery.

Munroe Regional Medical Center (Ocala, Fla.). Physicians at Munroe Regional Medical Center specialize in the treatment of spinal sprains, fractures, trauma, stenosis, sciatica and ruptured discs.

NewYork-Presbyterian Hospital (New York). The Spine Center at NewYork-Presbyterian helped spearhead the use of minimally invasive surgery for spinal conditions and continues to advance spine treatments through ongoing research trials.

Northern Michigan Regional Hospital (Petoskey, Mich.). Northern Michigan Regional Hospital includes comprehensive treatment and expedited appointment process.

Northwest Hills Surgical Hospital (Austin, Texas). Randall Dryer, MD, part of the Central Texas Spine Institute at Northwest Hills Surgical Hospital, is a past president of the Texas Spine Society.

Northwest Hospital & Medical Center (Seattle). Northwest Hospital & Medical Center partners with the neurosurgeons of Neurosurgical Consultants of Washington to provide neuro and spine care.

Northwestern Memorial Hospital (Chicago). Northwestern Memorial's Acute Spinal Cord Injury Center is partnered with the Rehabilitation Institute of Chicago to form the Midwest Regional Spinal Cord Injury Care System, designated as a model system of care by the government's National Institute on Disability and Rehabilitation Research.

NYU Langone Medical Center (New York). NYU Langone is a founding member of the National Spine Network and also serves as a major site for National Institute of Health research for low back disorders and spinal dysfunction in adults.

Ohio State University Medical Center (Columbus, Ohio). The hospital's Department of Neurological Surgery houses several neurosurgeons, including Daniel Prevedello, MD, who is trained in endoscopic endonasal procedures.

Oklahoma Spine Hospital (Oklahoma City). Oklahoma Spine Hospital is one of the country's first physician-owned surgical spine hospitals.

Oklahoma Surgical Hospital (Tulsa, Okla.). Oklahoma Surgical Hospital was founded in 2007 by a group of physicians who felt the hospital could offer more patient-centered care.

Parkview Orthopedic Hospital (Fort Wayne, Ind.). Parkview Orthopedic hospital is the first specialty hospital in northeastern Indiana that is devoted entirely to orthopedic surgery, including spine surgery.

Provena Saint Joseph Medical Center (Joliet, Ill.). The Neuroscience Institute at Provena Saint Joseph Medical Center includes specialists with expertise in restoring patients' quality of life.

Providence Sacred Heart Medical Center (Spokane, Wash.). The neurosurgery and spine programs at Providence Sacred Heart Medical Center treat numerous head, spine, cerebrovascular and peripheral nerve disorders.

Redmond Regional Medical Center (Rome, Ga.). Redmond Regional Medical Center recently opened its NeuroSpine Center, which offers one of the largest neurosurgeon teams in northwest Georgia.

Renown Regional Medical Center (Reno, Nev.). Orthopedic services, including spine surgery, at Renown Regional Medical Center are delivered with the latest technology and expert treatment teams of board-certified orthopedic surgeons.

Ronald Reagan UCLA Medical Center.

UCLA Neurosurgery and the UCLA Spine Center provide comprehensive care, ranging from minimally invasive brain and spinal surgery, neuroendoscopy and a host of others.

Rush University Medical Center (Chicago).

The Spine and Back Center at Rush University Medical Center is home to neurosurgeons and orthopedic spine surgeons, and it offers a spine program specifically tailored for women.

Salem (Ore.) Hospital. The Salem Spine Center opened in 2008 and includes neurosurgeons, pain management specialists and physiatrists.

Scripps Green Hospital (La Jolla, Calif.). Scripps Green Hospital is one of the region's leading sites for complex neurosurgical case referrals due to its clinical research advancements, imaging technology and advanced microsurgical tools.

Sky Ridge Medical Center (Lone Tree, Colo.). Sky Ridge Medical Center performs a high number of spine surgeries, and one of the first artificial disc replacement surgeries was also performed at Sky Ridge.

SSM St. Mary's Health Center (St. Louis). SSM St. Mary's Health Center uses a multidisciplinary team of both orthopedic and neuroscience to treat spinal conditions and deformities.

St. Alexius Medical Center (Bismarck, N.D.). The team of neurosurgeons at St. Alexius Medical Center's Neuroscience Center treats 20 different spine, cranial and peripheral nerve disorders.

St. Elizabeth Edgewood (Ky.). St. Elizabeth Edgewood's Spine Center houses one of the first spinal surgeons dedicated exclusively to providing spine services in northern Kentucky.

St. Joseph Regional Health Center (Bryan, Texas). From non-surgical treatments to specific spine surgeries, St. Joseph Regional Health Center's neurosciences program offers advanced care.

St. Joseph's Hospital and Medical Center (Phoenix). The Barrow Neurological Institute of St. Joseph's Hospital and Medical Center in the 1940s, and continues to provide innovative clinical care, education and research.

St. Mary's Medical Center (Huntington, W.Va.). St. Mary's Regional Neuroscience Center is the only medical center in the area with CyberKnife technology to treat spine and brain tumors.

St. Patrick Hospital (Missoula, Mont.). Randal Sechrest, MD, is the medical director of the Montana Spine Center, part of St. Patrick Hospital.

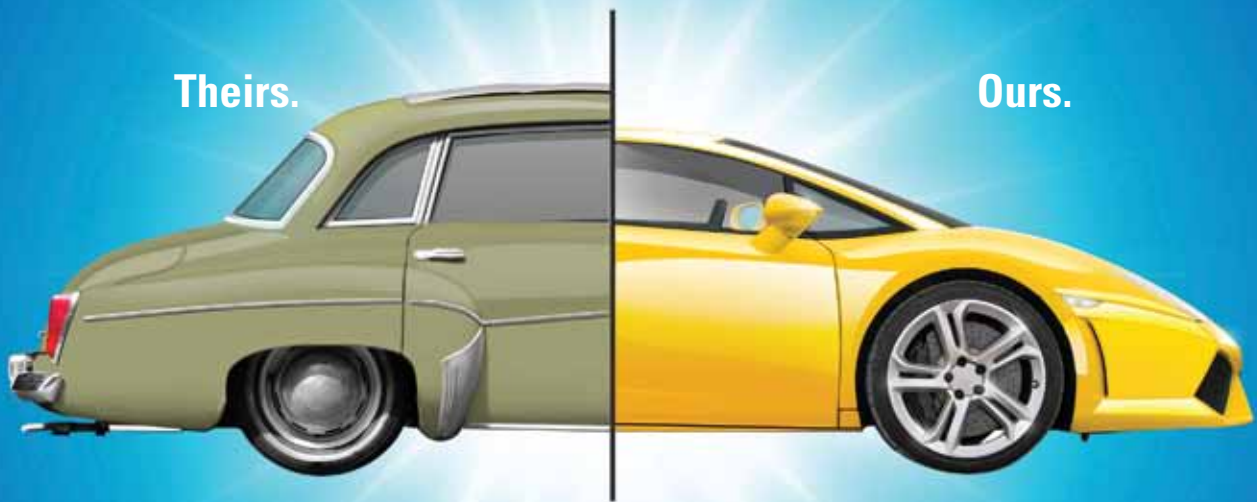
St. Vincent Indianapolis Hospital. St. Vincent's Neuroscience Institute and Spine Center partners with four Indianapolis-area neurological specialty groups to help patients suffering from spinal and neurological disorders.

Stanford Hospital & Clinics (Palo Alto, Calif.). The original CyberKnife, a non-invasive treatment that can be used to treat both cancerous and non-cancerous tumors on the spine, brain and other body areas, was developed at Stanford.

Texas Health Presbyterian Hospital Dallas. Texas Health Presbyterian Hospital Dallas has a Spinal Deformity Center, which specifically treats severe spinal curvatures and spinal tumors.

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Texas Spine & Joint Hospital (Tyler, Texas). Michael Russell, MD, spine surgeon and president of Physician Hospitals of America, is a part-owner of Texas Spine & Joint Hospital.

Thomas Jefferson University Hospital (Philadelphia). Thomas Jefferson University Hospital is affiliated with the Rothman Institute, which is located on the hospital campus and treats roughly 1,000 cases of spine trauma each year.

Tulsa (Okla.) Spine & Specialty Hospital. Tulsa Spine and Specialty Hospital has spine specialists who treat a wide range of conditions, such as spinal tumors, ruptured discs and spinal fractures.

University of California Davis Medical Center (Sacramento, Calif.). Researchers and neurosurgeons at UC Davis Medical Center are part of a study that is looking at whether a single injection of adult stem cells into diseased lumbar discs can repair and regenerate them.

University of California San Francisco Medical Center. The UCSF Spine Center offers three-dimensional and computerized surgery, clinical trials, motion-sparing surgery and access to spine tumor boards, which review complex spinal tumor cases.

University of Chicago Medical Center. One of the University of Chicago Medical Center's spine surgeons played a large role in the development of endoscopic techniques currently used to treat back and neck problems.

University of Iowa Hospitals and Clinics (Iowa City). University of Iowa Hospitals and Clinics includes the UI Spine Center, which offers treatment as well as clinical trials and spine research.

University of Maryland Medical Center (Baltimore). In 2008, the University of Maryland Medical Center used the first spinal disc replacement approved by the FDA to treat patients with degenerative disc disease.

University of Pittsburgh Medical Center. UPMC specialists can treat complex spine conditions, such as spinal fractures and spinal stenosis, and UPMC has consistently been a pioneer in minimally invasive neurological and spine surgeries.

University of Washington Medical Center (Seattle). University of Washington Medical Center's Department of Neurological Surgery includes one of the largest neurosurgical practices in the Northwest.

University of Wisconsin Hospitals and Clinics (Madison, Wis.). University of Wis-

consin spine specialists performed among the first laparoscopic spinal fusion surgery in Sept. 1993.

Vanderbilt University Medical Center (Nashville, Tenn.). Reid Thompson, MD, an award-winning research neurosurgeon, is the chairman of the Department of Neurological Surgery at Vanderbilt University Medical Center.

Valley Baptist Medical Center (Harlingen, Texas). Valley Baptist Medical Center includes several neurosurgeons and provides many spine specialties.

West Jefferson Medical Center (Marrero, La.). West Jefferson Medical Center partners with the LSU Health Sciences' department of neurosurgery to offer advanced treatment for complex spinal surgeries and to conduct neuroscience clinical research.

Williamsport (Pa.) Regional Medical Center. Part of Susquehanna Health, Williamsport Regional Medical Center's Neuroscience Center offers award-winning treatment in complex brain, spine and peripheral nerve conditions.

Yale-New Haven (N.H.) Hospital. The Neurosurgery Spine Center at Yale-New Haven Hospital is currently investigating ways to minimize spinal cord injury at the time of trauma to prevent further damage. ■

Spine vs. Neurosurgeon Compensation: Who Receives More?

By Laura Miller

1. Neurosurgeons received more compensation. Overall, neurosurgeons received compensation of \$6,845 more than spine surgeons in 2010, according to MGMA's *Physician Compensation and Production Survey: 2011 Report Based on 2010 Data*. Neurosurgeons were compensated at \$767,627 on average while spine surgeons received \$760,782.

2. Spine surgeons in a multispecialty practice had the highest compensation. Neurosurgeons in a single specialty practice (\$675,326) earned more than spine surgeons in the same situation (\$627,340) but less than neurosurgeons in a multispecialty practice (\$707,500). However, spine surgeons in a multispecialty practice (\$729,917) received more than their neurosurgeon counterparts.

3. Hospital-employed spine surgeons received more than employed neurosurgeons. Spine surgeons who are employed by hospitals received an average of \$714,088, which was over \$10,000 more than the average employed neurosurgeon. However, neurosurgeons who were not employed received on average over \$70,000 more than spine surgeons not employed by hospitals.

4. Neurosurgeons received more in almost every region of the country. The only region where spine surgeons overall received higher compensation than neurosurgeons was in the Midwest, where spine surgeons received \$777,988 and neurosurgeons received \$747,947. The biggest disparity

between the two was in the western part of the country, where neurosurgeons received over \$150,000 more than spine surgeons, who received \$562,908.

5. New spine surgeons received more, but neurosurgeon compensation grew faster. For surgeons who have been in practice for three to seven years, spine surgeons received slightly more (\$600,207) than their neurosurgeon counterparts, who received \$596,702. However, compensation for neurosurgeons grew faster and at the peak of their practice; they were compensated on average about \$200,000 more than spine surgeons. Spine surgeons who have been practicing eight to 17 years received \$737,593 while neurosurgeons in the same group received \$936,126. ■

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Healthcare Reform and its Effect on Pain Management: Q&A With Dr. Laxmaiah Manchikanti of the American Society of Interventional Pain Physicians

By Abby Callard

Laxmaiah Manchikanti, MD, is the chairman of the board and CEO of the American Society of Interventional Pain Physicians and the Society of Interventional Pain Management Surgery Centers; medical director of the Pain Management Center of Paducah (Ky.); and associate clinical professor of anesthesiology and perioperative medicine at the University of Louisville, Kentucky.

Q: What are some of the major issues facing pain management in regards to healthcare reform?

Dr. Laxmaiah Manchikanti: There are various issues for interventional pain management which are the same as the other areas of medicine. Specifically, these include coverage policies. Interventional pain management is not considered as an essential service, thus coverage is minimal.

Numerous other regulations whether related to healthcare reform or associated with it include mandatory transition to ICD-10, almost mandatory implementation of electronic health records along with a multitude of regulations and infection control practices associated with single-dose vials. These practices create a critical shortage of medicines and exorbitantly high costs. None of these activities improve patient care; rather they reduce it.

Q: How will ICD-10 affect pain physicians?

LM: ICD-10 will affect pain physicians substantially. There is a whopping 712 percent increase in codes; however, at the same time, there are 119 codes in ICD-9 which can map to more than 100 distinct ICD-10 codes, whereas there are 255 instances where a single ICD-9 code can map to more than 50 ICD-10 codes. The majority of the pain management codes do not map into such increased numbers; however, they do map into approximately five to 10 codes. Some codes such as spinal stenosis have approximately 30 ICD-10 codes. A physician has to think about and also use multiple codes if they are working just on the cervical spine instead of one code. There may be three different codes used for one treatment and one or two procedural CPT codes.

The worst situation is that multiple ICD-9 codes may be changed to one code. There are approximately 3,700 instances in the mapping for diseases where a single ICD-10 code can map to more than one ICD-9 code. As I have described related to pain management, post laminectomy

syndrome, which is described by four codes now — 722.80, 722.81, 722.82, and 722.83 — will be converted into one code which is labeled as M96.1. This will create confusion and misunderstanding and no one will know which part was treated or which part is suffering. Especially if a person had surgery in the cervical spine, thoracic spine and lumbar spine and developed pain or post surgery syndrome in all three regions, you will still be using only one code. If you have to treat these patients separately with three separate interventions, you will be using only one code, and that will raise a red flag and confusion for quality as well as preparing for evidence-based management in the future.

Q: How will ICD-10 affect the management and development of evidence-based guidelines?

LM: Combining these codes will definitely hinder evidence-based medicine; however, increasing the number of codes may have a very minimum effect since the present codes already reflect significant differentials. ICD-10 has nothing to do with evidence-based medicine or justification. ICD-10 codes will actually cause confusion and ultimately it will be difficult to present evidence-based medicine because of the confusion.

Q: What will be the greatest challenges to providers?

LM: Providers will be bombarded with new information and new codes. It will be a whole learning experience, and may take several days to weeks to understand fully, and may not be perfected for years. To do this, it will be extremely expensive. Practices will have to develop resources, both human and financial. The estimated cost per physician is projected to range from \$25,000 to \$50,000; however, it may go upwards and the technology may have to be replaced every two to three years.

Other challenges are related to entering into an entirely different system one day. At this time you really cannot compare your old data with the new data. This will affect billing and coding training for personnel in these departments. Believe me, it will be very expensive. Even today, we use an extremely complicated system known as ICD-9-CM, which is in three volumes. This is not only used for disease classification, but it is also the



standard for payment justification and supporting medical necessity for a procedure or a service provided to a patient in a healthcare setting.

Q: What are the advantages of the transition from ICD-9 to ICD-10?

LM: The major advantage of ICD-10 is effective reporting of morbidity statistics. However, no one knows how much benefit it has provided in other countries. There are numerous articles written describing its disadvantages.

For example, the *Wall Street Journal* on September 13, 2011, had an article which said, “Walked into a lamp post? Hurt while crocheting? Help is on the way.” This article describes that today, hospitals and doctors use a system of about 18,000 codes to describe medical services and bills they send to insurers. Apparently, that doesn’t allow for quite enough new ones. The *Journal* describes the new federally mandated [ICD-10] version that will expand the number to around 140,000 — adding codes that describe precisely what bone was broken or which artery is receiving a stent. It will also have a code for recording that a patient’s injury occurred in a chicken coop.

Indeed, health plans will never again wonder where a patient got hurt. There are codes for injuries in an opera house, art galleries and nine locations in and around a mobile home, from the bathroom to the bedroom.

Q: Does that information hold any clinical importance?

LM: This really does not hold any significant validity or value for clinical medicine. It may be useful epidemiologically by providing data on how people get hurt, etc.

Q: In the long-term, do you think ICD-10 will improve the quality of pain management treatment?

LM: Proponents are stating that it will improve quality. It may improve quality with regards to statistical analysis of morbidity. However, this will come at a very high cost. I do not believe that the improvement in quality is enough to put medical

professionals through so much expense and cost during a time when regulations are exploding, numerous changes in healthcare reform are being implemented, reimbursements are being reduced and there is a lack of coverage for most of conditions except for essential conditions.

Q: What do you think should be done with ICD-10?

LM: ICD-10 should be postponed permanently. ASIPP is contacting the administration and members of Congress. There are other issues related to improving the care and access that we should focus on.

Q: What are those issues?

LM: The uninsured numbers are escalating. For those who are insured, premiums are rising, coverage is reducing, co-pays and deductibles are increasing. Medical practices have to spend more and more to meet regulations and to implement healthcare reform, resulting in reduced reimbursement and increased work. The multiple other issues related to today's practice are infection control practices such as using single-dose and multi-dose vials for a single patient, which increases expenses by approximately four to five times for the drug costs, and also the ever-increasing regulations and escalating costs of mandated electronic health records. These aspects are driving many practitioners out of business and to early retirement. ■

Dr. Scott Glaser: The Need for Interconnected Prescription Monitoring Programs

By Abby Callard



In the past 20 years, physicians have been urged by many groups to treat pain more aggressively — which often means prescribing more opioids and other prescription pain medications. This push has led to the number of prescriptions for opioids increasing dramatically, says Scott Glaser, MD, DABIPP, president of Pain Specialists of Greater Chicago and a board member of American Society of Interventional Pain Physicians.

But this increase in prescription drugs in the market has led to serious negative consequences — in some places in the country, a person is now more likely to die as a result of accidental poisoning secondary to prescription medication, either legally or illegally, than die in a car accident, Dr. Glaser says.

“Increased prescribing is correlating with an increase in death and emergency room visits,” he says. “We prescribe these medications to patients with pain, but some of these patients are going to develop an abusive relationship with the medication or they may give it away, sell it, or have it taken from them by people who are abusing it. It’s had this unintended consequence of a rapidly increasing number of accidental poisonings and emergency room visits.”

Dr. Glaser says everyday in the United States, 75 people die from such accidental poisoning — essentially when a person dies from misusing, abusing or overdosing on a drug or drugs. Abuse of prescription drugs, including opioids, has risen to a level never before seen. In 2009, the number of first-time drug users reporting their first drug as nonmedical use of pain relievers (2.2 million) was almost the same as those reporting marijuana (2.4 million), and today, opioid overdoses cause more deaths than overdoses of cocaine and heroin combined.

“That’s the kind of growth in the prescription drug abuse that we’re seeing,” Dr. Glaser says. “You don’t have to buy it from a dealer, you don’t have to smoke it. It is seen as safer since it is prescribed and this in combination with increased availability secondary to increased prescribing has caused these drugs to surge into the lead of illicit drug use.” One of the ways prescription drug abuse can be battled is through prescription monitoring programs, Dr. Glaser says. He calls them “one of the most important aspects of the field of interventional pain management.”

However, he warns, while monitoring programs are a tool to help physicians and others monitor drug use, they aren’t a solution for substance abuse.

“The prescription monitoring programs, in and of themselves, they don’t cure or stop prescription drug abuse. They allow us to monitor people,” he says. “They try to stop people from profiting from prescription drugs, from feeding off these problems of others. It also allows us to intercede when patients may be developing an abusive problem sooner rather than later when lives and families can be wrecked.”

Dr. Glaser wants the monitoring program databases to be seen as a source of information for physicians to use when treating a patient for pain.

“The databases are information for doctors,” Dr. Glaser says. “They don’t say if the person is addicted. It’s just information for a doctor to take into account so that they can assess the patient fully and help them whether it is uncontrolled pain or a substance abuse disorder.”

About 90 percent of patients seeking treatment in a pain management practice are already on narcotics prescribed by their primary physician, emergency room physicians or orthopedic physicians, says Dr. Glaser, though his practice skews a little higher at 98 percent. Even though primary care physicians have been urged to treat pain more aggressively, pain management and prescribing controlled substances appropriately and safely is not part of their training.

“They know a little about a lot,” Dr. Glaser says. “There’s a big push at a national level to possibly require doctors who prescribe narcotics to have extra training. As specialists, we’re already getting that training.”

Dr. Glaser is in favor of providing extra training for primary care physicians. “I think it is important, I think there should be some extra training. The treatment of pain and the prescribing of controlled substances is woefully understood and not taught in a medical-school level,” he says.

Training, such as continuing education and lectures, will impress upon physicians the seriousness of prescribing pain medications. Dr. Glaser also thinks there should be a certification program to confirm the physicians understand the risk involved. He is not among the physicians that think

requiring extra training will have a negative effect on the treatment on pain, but he does not think primary care physicians should be legally obligated to check the databases.

“One interesting thing that I’m seeing is that a lot of states, like Nevada, require doctors to access the database before they prescribe a controlled substance,” Dr. Glaser says. “I think that puts too much liability on the doctor’s part. We do it naturally and routinely as specialists, but primary care doctors shouldn’t have to do that. To require them to access the information exposes them to too much liability, it’s too egregious.”

Although not requiring certain physicians who prescribe pain medication might seem to weaken the databases and the monitoring programs, Dr. Glaser says it comes down to an issue of liability.

“Doctors are incredibly regulated and so liable — so out there as far as liability — [requiring them to check the database] just increases the liability of a doctor, but it’s not going to make the database any better. The primary concern should not be penalties for not using the database. It should be on education on how to best use that database. I don’t think any money or time or effort should go into creating a law to penalize doctors for not using it. All that time and effort should be used by medical societies and associations to require that doctors are getting education so they know they want to check the database and what to do with the information.”

As part of the 2005 National All Schedules Prescription Electronic Reporting bill, all states are required to have prescription monitoring programs. Although 48 states have laws on the books, only 36 currently have active programs. Dr. Glaser says the most effective state regulation is the Kentucky All Schedule Prescription Electronic Reporting act, which the NASPER bill was based on.

“KASPER is truly fulfilling the goal of having an active program,” he says. “It is about to be interconnected with their bordering states.”

Interconnectivity, which is mandated in the NASPER bill, is something that states are starting to implement, Dr. Glaser says. It’s an important aspect to prescription monitoring programs.

“In Chicago, we’ve had patients who we found out were getting prescriptions from us, and when we checked the database, the database was fine. Turns out that they were going to Indiana and Wisconsin to get drugs. We need that interconnectivity,” he says.

Kentucky is planning a pilot program to share its prescription monitoring program data with Ohio and vice versa. This way, a physician can look up prescription data for a patient in both states to prevent prescription drug shopping. Kentucky also recently created a task force with Ohio, Tennessee and West Virginia. The task force, which includes representatives from state agencies such as the Justice and Public Safety Cabinet, state police, the Office of Drug Control Policy and the attorney general’s office, will make recommendations on policy to the state governors.

Even though the NASPER bill passed in 2005, it has yet to be fully funded, Dr. Glaser says. That’s why only 36 states have functional prescription monitoring programs on the books. There’s a competing bill known as the Ryan Creedon Act of 2011, introduced by Rep. Hal Rogers of Kentucky. According to Dr. Glaser, the bill is the reason NASPER has not been fully funded; conflicting support within the legislative bodies has slowed forward movement. The bills differ slightly. The Creedon Act of 2011 focuses more on law and order, Dr. Glaser says, while the NASPER bill is from a medical viewpoint.

“Substance abuse is really a medical problem,” he says. “These programs need to be oriented toward doctors. The police don’t have the knowledge base to understand all of the medical issues associated with the treatment of pain and substance abuse. Doctors need to be the ones evaluating the statistics in the prescription monitoring program. We can’t allow law enforcement to have unhindered access.”

The important thing to remember, Dr. Glaser says, is that the reason physicians are prescribing pain medication is that there are a lot of people with chronic pain — more than 100 million according to recent government estimates. The key is being able to monitor prescription drug use and minimize negative side effects. ■

10 Ways to Improve Profitability for Pain Management

By Abby Callard

Pain management is a specialty in flux. Not only are more chronic pain sufferers seeking out treatment, but the release of a recent Center for Disease Control report, which found more people die from prescription drug overdoses than heroin and cocaine combined, has created a backlash over opioid prescriptions and a call for alternative treatments.

“We’re in an era where pain management is high profile,” Robert Saenz, CEO of Tulsa Pain Consultants and president of VIP Medical Consulting, says. “There are many more patients walking through the door. I believe that out of chaos, there is opportunity.”

Richard Kube, MD, CEO, founder and owner of Prairie Spine & Pain Institute in Peoria, Ill., says part of that opportunity is creating an integrated pain practice.

“There’s a vast opportunity to capture a market which is a very, very good performance margin for your practice,” he says.

By changing the way Tulsa Pain Consultants operated, Mr. Saenz increased the center’s revenue by about \$10 million annually. Here are 10 steps for a

pain management center to increase profitability. Some of these are easy fixes, such as automating telephone calls, and others involve a fundamental shift in the way a practice operates.

1. Increase patient volume. The first step to increasing profitability in a pain management practice is to generate more patients, says Scott Anderson, COO, Prairie Spine & Pain Institute. Most patients come to a pain management practice on referrals from primary care physicians, so one way to increase patient volume is by generating more referrals from primary care physicians.

“When you’re considering generating new patients, the clinical model is as important or more important than any other component of the practice,” he says. “What clinical services are you going to provide that create a unique story that makes the referring physicians want to send you 100 percent of their patients with a pain condition? When you have built a strong relationship with multiple providers, your interventional business will be dramatically enhanced.”

2. Hire a physician liaison. Once a practice establishes what primary care physicians want and works toward providing that, someone has to tell

the primary care physicians that the services are available. Hiring a physician liaison is an effective way to do this, says Mr. Anderson.

“This person should be out in the field five days a week, buying lunches for and interacting with the primary care physician community,” Mr. Anderson says.

A well trained and highly motivated physician liaison should be able to add 50-75 referrals to your practice (or ASC) every month. The ideal person for the job holds a four-year degree in an allied health field such as functional or behavioral health. They should have an outgoing personality and be very comfortable meeting and speaking with people. Mr. Anderson says to stay away from people with nursing degrees or experience as a pharmaceutical representative.

3. Communicate with primary care physicians. Communication with primary care physicians who refer patients is key and will ensure that physicians continue to refer to your facility, says John Bookmyer, CEO of Pain Management Group, a management company in Findlay, Ohio.

“Providing timely reports and updates to referring physicians and primary caregivers and specialists is critical and included in every step of our pain management care plan,” he says. “We see our relationships with referring physicians as partnerships. They know their patients’ history and needs, and we bring insight, support and treatment to an area that many primary care physicians do not have training and a comfort level with.”

4. Provide the referring primary care physicians with the clinical services they want. This is where many pain practices have fallen short, Mr. Anderson says.

“The number one thing a primary care physician is looking for is to meet the needs of their chronic pain patient population by taking over the management of that patient’s condition,” Mr. Anderson says. “When you take over the management of that patient’s condition, you will see a significantly higher number of referrals.” Of course you will need to build a team to manage this new influx of patients and their unique needs, as your specialists cannot afford to coordinate care for this patient population.

Dr. Kube estimates that 95 percent of pain management practices operating today are moving toward a procedure-based model instead of an integrated care model.

“A lot of the pain practices are trying to become very much in tune with and involved with doing procedures all the time,” he says. “As such, the very reason for primary care physicians to refer the patient to you in the first place is being diminished by most pain practices. Chronic pain management is a part of pain management. If you’re going to be a pain center, you really have to do all of it.”

Providing comprehensive pain management services also ensures that practices aren’t losing pieces of revenue such as physical therapy, behavioral therapy, durable medical equipment and other clinical services. With this model, Mr. Anderson estimates the revenue per patient life will grow from \$2,500 to \$10,000-15,000 using a fully integrated facility based care model.

5. Maximize physician case load. Once the practice establishes a pipeline for referrals, all the physicians need to be working at their capacity in order to maximize procedures and make sure the practice can handle the increased case load. One way to do this is by ensuring every staff member is working at his or her pay grade, says Mr. Saenz. For example, physician assistants should not be taking patients from the waiting room to the procedure room. A less-qualified staff member can handle that so the physician assistant can concentrate on higher-level tasks. This will trickle up to the surgeons themselves, and they will have more time to be doing procedures, Mr. Saenz says.

Although he has found resistance among physicians, Mr. Saenz says increasing case load is not about rushing procedures but rather speeding up the other aspects of a visit such as registration, insurance verification, setting a patient up in a room and discharge.

“If you reduce the wait time, you’re able to accommodate more flow,” he says. “Pain management is a volume-driven practice. Let’s say an epidural steroid injection could take 10-15 minutes depending on the doctor, if you add on another 15 minutes of unnecessary processing time, you just cost yourself one more patient that you could have seen. If you can add one patient per hour, that’s 15 more procedures a week. If you do the math, it starts accumulating over a year.”

6. Offer cutting-edge treatments. Part of creating a unique story for referring physicians is being able to perform all pain management procedures such as spinal cord stimulator implants and radiofrequency ablation. Mr. Saenz says the returns for physicians are favorable for both of these procedures.

Francis Riegler, MD, co-founder of Universal Pain Management, says that because there are only three medical device manufacturers of spinal cord stimulator devices, the market is highly competitive. He recommends practices check with other vendors in their area to make sure they are getting the best price. There are also rebate programs for these devices.

7. Incorporate anesthesia. Mr. Saenz has also seen some practices incorporating anesthesia into some of their procedures when it’s medically necessary. Anesthesia can add increased revenue when compared to no sedation or conscious sedation.

“The important thing to remember here is that this has to be based on a patient-by-patient case and strict protocols should be adhered to in order to abide by regulatory requirements and standard of care,” says Mr. Saenz.

8. Maximize the center’s use of space. At Tulsa Pain Consultants, Mr. Saenz evaluated every inch of space within the center including the large conference room that was not bringing in any revenue, he says. After converting the room into two additional procedure rooms, the practice cut its wait time from eight weeks to five days.

“That just enhanced our volume intensely,” he says.

9. Automate reminder phone calls. When Mr. Saenz arrived at Tulsa Pain Consultants, reminder phone calls were made by operators. He set up an automated system that reduced the cost of the hundreds of daily calls to pennies, he says. Patients would press a button to indicate that they weren’t coming, and a scheduler would call them back. The practice was able to reduce no-shows this way.

“By plugging that flaw, we were able to keep the schedule full,” he says. “We got rid of last-minute holes. The schedule is the most important part of flow.”

10. Double-check all reimbursements. Receiving proper reimbursements is essential to profitability, and making sure staff is well-trained can ensure reimbursement is done correctly.

“We encourage well-trained preauthorization and registration personnel to ensure compliance with payor agreements when scheduling patients,” says Mr. Bookmyer. “In addition, we have equally well-trained physicians help manage denials when received after service.”

Mr. Saenz recommends that the contracts with payors are double-checked to make sure the practice received the agreed-upon reimbursement for every procedure. He also warns physicians to make sure they are coding their procedures correctly.

“In many cases, we find that they’re undercoding,” Mr. Saenz says. “Sometimes doctors become so intimidated that they tend to undercode, and they’re hurting themselves and their profitability. All these changes and tweaks may sound like small dollars, but when you’re treating thousands of patients, these dollars add up to significant revenue.” ■

28 Pain Management-Driven ASCs to Know

By Abby Callard

This is a list of pain management-driven surgery centers researched and compiled by the Becker's ASC Review editorial staff. Surgery centers do not pay and cannot pay to be selected for inclusion on this list. Centers are listed in alphabetical order. This list is not an endorsement of any individual's or organization's clinical abilities.

Advanced Surgical Concepts – Pain ASC (Baton Rouge, La.). Advanced Surgical Concepts is an outpatient surgery center located in the same facility as Comprehensive Pain, the state's only accredited center for pain treatment specializing in spinal cord stimulation, selective nerve root blocks and chronic pain.

Boston PainCare Surgery Center (Waltham, Mass.). This clinic opened in May 2007 and currently has 10 board-certified physicians. The center averages 3,700 procedures a year, 3,400 of which are pain management. Treatment includes radiofrequency ablation and spinal cord stimulator implants.

Centers for Pain Solutions (Nashua, N.H.). The Centers for Pain Solutions was started in 1999 and offers discography, spinal cord stimulation, spinal catheters, radiofrequency nerve lesioning and disc nucleoplasty, among other treatments.

Center for Pain Control (Wyomissing, Pa.). Physicians at this center have treated several conditions, including low back, leg, neck and arm pain, at this ASC for more than 12 years. Staff constantly measure treatment outcomes and both patient and referring physician satisfaction.

Christiana Spine Center (Newark, Del.). The Christiana Spine Center has been in operation on the Christiana Care Hospital campus since June 2000. The ASC specializes in spinal epidurals, discography and nerve ablations, and physicians perform more than 5,000 procedures annually.

Hallandale Outpatient Surgical Center (Hallandale Beach, Fla.). This multi-specialty center was founded in 2006. Treatment options include peripheral nerve stimulation, spinal cord stimulation and percutaneous disc decompression.

Harrisburg Interventional Pain Management Center (Mechanicsburg, Pa.). This center is exclusively focused on interventional pain management and is located in the same building

as Susquehanna Valley Pain Management. Procedures include radiofrequency lesioning, lumbar discograms and facet joint injections.

High Pointe Surgery Center (Lake Elmo, Minn.). The interventional pain management program at High Pointe Surgery Center was initiated in 1999. Treatment includes trigger point injections, facet blocks, nerve stimulators and radiofrequency procedures.

Hyde Park Pain Management (Hyde Park, Mass.). Hyde Park Pain Management received its state license in June 2010. The center includes technology and equipment to do trials for neurostimulation, nerve stimulation and radiofrequency procedures.

Idaho Physical Medicine and Rehab (Meridian, Idaho). The surgery center opened in 2007, but the center's physician-owners are all are focused on pain management. Services include fluoroscopic spine injections, radiofrequency ablation, spinal cord stimulation and acupuncture.

Interventional Spine and Pain Management ASC (Conyers, Ga.). Robin Fowler, MD, founded Interventional Spine and Pain Management ASC in 2005, and now operates eight locations. Treatment includes peripheral nerve stimulators, spinal cord stimulators, transforaminal epidurals and radiofrequency ablation.

Matrix Surgery Center (Saginaw, Mich.). The Matrix Surgery Center has been treating pain in the Saginaw area since 1999, when it was associated with Covenant HealthCare. The center has three operating rooms and five treatment rooms.

New England Pain Care, Pain and Wellness Center (Peabody, Mass.). New England Pain Care and the Pain and Wellness Center were both founded by Julien Vaisman, MD. He center uses Providers' Roundtable, a bi-weekly meeting where the entire provider team reviews individual cases.

Overlake Surgery Center (Bellevue, Wash.). This center was founded in 2000 as a joint venture between Overlake Hospital Medical Center and several physicians. Treatment includes pain management procedures, including vertebroplasty, spinal cord stimulators and hypogastric plexus blocks.

Pain Care Center of Georgia (Stockbridge, Ga.). This center was opened in 2009 by Vincent Galan, MD, as part of Pain Care of Georgia. The physicians perform radiofrequency, spinal cord stimulators, discography and neuropathies. The center is involved in clinical trials.

Pain Management Center of Paducah (Paducah, Ky.). The Pain Management Center of Paducah is the home of Laxmaiah Manchikanti, MD, who serves as medical director of the center as well as chairman of the board and CEO of the American Society of Interventional Pain Physicians and the Society of Interventional Pain Management Surgery. The center is accredited by AAAHC.

Pain Management Center of Virginia (Reston, Va.). The Pain Management Center of Virginia was started in 2006, and is affiliated with Virginia Spine Institute. Treatment includes discography, fluoroscopic guided injections, caudal steroid injections, radiofrequency ablation and spinal cord stimulators.

Peninsula Procedure Center (Redwood City, Calif.). The physicians at this center perform several pain management procedures, including epidural injection, nerve blocks, spinal joint block and injections and rhizotomy. The center opened in Sept. 2007 and is managed by MedBridge

Premier Pain Center (Covington, La.). The center's founding physician, Allan T. Parr, MD, served as the president of the American Society of Interventional Pain Physicians and has been practicing pain management in the Covington area since 1994. The center offers specialty procedures such as spinal cord stimulation and vertebroplasty.

Riverdale Surgery Center – Pain ASC (Riverdale, N.J.). The center offers treatments for chronic back pain, neck pain, neuropathic pain, sciatica, cancer pain and postoperative pain. Physicians at the center have lectured on topics such as spinal cord stimulation.

Sioux Falls Surgical Hospital Pain Clinic (Sioux Falls, S.D.). This ASC is located within the Sioux Falls Surgical Center, which was founded in Oct. 1985. The center's medical director, Timothy Metz, MD, is board certified in

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anesthesiology and perioperative ultrasound and has advanced certification in kyphoplasty and spinal cord stimulation techniques.

The Spine Center (Maryland). The Spine Center operates nine locations throughout Maryland. The first of its centers opened in Rockville in 1998, and a 10th center is scheduled for Greenbelt in 2012. Treatment includes discrodes, neurostimulation trials and implants and intra-discal electro-thermal ablations.

Springfield Surgical Specialists (Springfield, Mo.). Pain management specialist at Springfield Surgical Specialists Jim Daily, MD, says he helped start the ASC because, "I was in the hospital environment for 22 years and I was tired of not being able to give the type of care and

attention that I wanted to give."

Stonegate Surgery Center-Pain Management (Austin, Texas). The physician-owners formed the center five years ago. Administrator Lauri Rose, MBA, CASC, says the center's success is attributable to the teamwork approach taken by every staff member.

Theda Oaks Surgery Center (San Antonio, Texas). The Theda Oaks center opened in 2004. The center offers cervical, thoracic and lumbar procedures such as radiofrequency rhizotomy and percutaneous disk decompressions as well as spinal cord stimulator trials and implantations.

Total Pain Care (Meridian, Miss.). Total Pain Center physicians Kenneth E. Staggs Jr., MD, and

Eric J. Pearson, MD, were past presidents of the Mississippi Pain Society. Treatments performed at the center include spinal implants, radiofrequency and fluoroscopically guided pain injections.

West Central Surgical Center (Toledo, Ohio). This center was created in 2005 and serves Northwest Ohio and Southeast Michigan. The physicians perform radiofrequency ablations, transforaminals, pump trials, spinal cord stimulator trials and SI joint injections.

Wilton Surgery Center (Wilton, Conn.). This ASC specializes in pain management and ophthalmology and opened in Sept. 2005. It has two-operating rooms and two-procedure rooms. The center is currently in a partnership with AmSurg and Stamford Hospital. ■

5 Points on Ultrasound for Pain Management

By Abby Callard

Ultrasound technology is an emerging technology for pain management and can be used in both diagnostic and procedural applications. Michael Gofeld, MD, University of Washington assistant professor in the Department of Anesthesiology and Pain Medicine and the Department of Neurological Surgery, discusses the future of ultrasound technology for pain management.

1. Ultrasound results in increased diagnostic specificity. MRI is the most common imaging technology used in musculoskeletal diagnosis; however it is a static tool, says Dr. Gofeld. Patients have to lie immobile in the scanner, and it produces a "snapshot of this moment," he says. But often, a still picture doesn't tell the whole story. For example, with nerve impingements or entrapments, it's essential to see how the nerves and joints are working in motion.

"Ultrasonography makes it live, we can see exactly what is going on," he says. "This is a really sensitive and specific diagnosis at the point of care."

An ultrasound can also give physicians a more detailed diagnosis. MRI cannot pick up superficial layers, small nerve injuries and anatomical structures hidden by surrounding scars and metallic hardware. Ultrasound also allows physicians to see the internal architecture of the nerve. An MRI can show if the nerve is entrapped or enlarged, but it will not give an assessment of the internal structure which can tell physicians if the nerve is damaged beyond repair.

This is important to make treatment decisions. For example, if the nerve is entrapped but the nerve fibers aren't damaged, a simple nerve release and transposition can solve the problem. However, if the nerve fibers are damaged, the nerve has to be grafted or nerve stimulating techniques are considered. This specificity makes Dr. Gofeld predict that the ultrasound will become a

"new-wave stethoscope for diagnosis of painful conditions" in the future.

2. Ultrasound can improve procedure quality. Using an ultrasound for procedures can reduce complications and result in higher success rates, Dr. Gofeld says. Ultrasound is especially helpful in procedures such as stellate ganglion blocks, cervical nerve root blocks and joint injections. In joint injection, the ultrasound actually allows the injection to bypass the joint altogether and be injected into the space just outside the joint, which usually serve as "fluid collectors" when the joint is inflamed, he says. Injections in this area are virtually painless, he says, and provide just as much pain relief as an injection directly into the joint itself.

An ultrasound also makes it easier for physicians to locate hard-to-find nerves. For example, entrapment of the lateral cutaneous nerve of the thigh, which causes severe neuropathic pain, cannot be found without an ultrasound. Another promising application is for peripheral nerve stimulation, which Dr. Gofeld has conducted research on. Traditionally, this procedure involved a large incision. Using ultrasound, physicians can transform the procedure into one that is minimally invasive and results in just as much pain relief.

3. The technology repays itself in three to four months. Dr. Gofeld estimates the price range for ultrasound machines to be \$5,000-\$500,000. The \$5,000 machine is essentially a transducer that can be hooked up to any computer and produce low-quality images. A machine of this quality is not very useful for clinical practice, he says. On the other end of the spectrum, the \$500,000 machine is what Dr. Gofeld uses for his research. This produces an image of microscopic quality allowing him to create an anatomical structure of the nerves or the spinal cord.

He says the typical price range for machines used in pain management facilities is \$20,000-\$80,000, and the machine will pay for itself in three to four months with a good volume of cases. The ultrasound equipment is less expensive than fluoroscopy equipment, which is commonly used for these procedures. There is also no radiation exposure with ultrasound, he says.

4. Payors are currently reimbursing procedures with ultrasound. Dr. Gofeld says he has not had problems with reimbursement for ultrasound procedures, but has had the occasional rejection for injections aided with a fluoroscope. He says a simple ultrasound procedure reimburses very well for a physician practice.

"Payors are willing," he says. "We don't have rejections for ultrasound injections."

However, it's important to only use ultrasound when it's medically necessary. For example, a payor might reject a claim for an injection in the finger joint done with ultrasound because the joint is so easy to see, he says.

"The deeper or more complex the injection, the easier it is to explain medical necessity," he says.

5. Medicare might disprove some applications in the future. Dr. Gofeld says whenever a procedure or new technology is a point of revenue for physicians, it can also become a point of abuse. Ultrasound usage is no different. He says the increase in claims of injections with ultrasound will cause Medicare to investigate the applications and eventually to disprove some of them. Dr. Gofeld predicts trigger point injections with ultrasound will almost definitely not be reimbursed next year. That change isn't too bad in and of itself, he says, but it can have a snowball effect.

"When they disprove one application, it can cause an avalanche and chain reaction," he says. ■

12 Research and Development Projects for New Orthopedic & Spine Technology

By Laura Miller

DePuy Orthopaedics recently announced its plan to spend \$7 million on research and development equipment for its company by 2014. At the same time, it announced plans to spend \$20 million on manufacturing equipment.

Eminent Spine, a Georgetown, Texas-based medical device company, has recently completed and released the results of a study of its King Cobra Anterior Cervical Plate in which none of the 25 patients experienced complications.

Israel-based medical device company **Expanding Orthopedics** has launched a post-market study in Europe to assess its XPED Expanding Pedicle Screw System for spinal fusion. The study will enroll up to 50 patients and test the usability of the products for 24 months postoperatively.

Surgeons at the **Hospital for Special Surgery** are working on studying the outcomes of joint replacements for patients over the age of 50 after they return to regular activity. The study is looking at long-lasting joint implants, including a “30-year knee” implant approved by the FDA which withstood the simulation of 30 years in use.

Anderson Orthopaedic Research Institute has partnered with the Cleveland-based medical device company **ImageIQ** for joint replacement research using three dimensional imaging analytics to enhance orthopedic implant wear studies. The data generated from the research will be used to reduce the frequency of joint replacement implant failures and improve the quality of life for patients.

InVivo Therapeutics recently released data supporting the use of its technology for treating spinal cord injuries in rodent models. The company’s proprietary biopolymer scaffold showed positive preliminary data indicating a therapeutic effect in the rodent model. The company has proposed a 10-patient pilot study in humans with acute spinal cord injury, which could begin as early as next year pending approval from the FDA.

Atlanta-based orthopedic device company **MedShape Solutions** has received the Small Business Innovation Research Phase I grant from the National Institutes of Health to support research and development with its compliant shape memory device for meniscal repair. Paired with potential additional funding phases, the grant could total more than \$1.5 million if the company achieves target Phase I development milestones.

The United States Army Telemedicine & Advanced Technology Research Center has given **Semprus BioSciences** a \$1 million grant for orthopedic device research and development. The company will develop the first orthopedic devices designed to reduce biofilm formation after implantation.

Stryker recently announced a partnership with **OrthoSensor** to study the company’s technology with the Triathlon Knee. The OrthoSensor Knee Trial is an intelligent trail design to provide quantitative, intraoperative feedback, which allows surgeons to balance the joint during total knee arthroplasty.

Spine device company **Synthes** has partnered with **Eli Lilly and Company** to develop site-specific osteoinductive products based on Synthes’ biomaterials and Lilly’s biologics or pharmaceuticals business. The companies will also fund and conduct evaluation of additional orthopedic uses for Lilly’s osteoporosis drug Forteo.

German medical device company **Ulrich** is now using Zwick GmbH to test servo-hydraulic fatigue for quality control and development of its spinal implants. The testing will make sure implants are strong and reliable, with tests that can simulate the effects of posture change on implants.

Researchers at the **University of Pittsburgh** have been using a wireless chip they patented to track and monitor surgical implants. The chip is attached to orthopedic devices and tells the surgeon about the pressure of the implant, chemical balance, temperature of the surrounding tissue and nearby harmful organisms. ■

10 Orthopedic & Spine Device Company Financial Reports

By Laura Miller

ArthroCare reported \$83.3 million during 3Q, a 3.7 percent decrease from the same period last year. The company’s worldwide sports medicine sales experienced a 1.6 percent increase.

Biomet experienced a 4 percent increase in net sales during 2Q of the 2012 fiscal year, despite a 5 percent drop in worldwide spine sales. This comes after a 10 percent drop in spine sales during 1Q of FY 2012.

Johnson & Johnson’s **DePuy Orthopaedics** reported a 1.5 percent decrease in U.S. sales during 3Q of 2011. Worldwide sales increased by 5.7 percent. J&J reported \$109 million in total expenses due to litigation related to the DePuy ASR Hip implant recall last year.

Medtronic reported 2Q revenue of \$4.1 billion, which is a 6 percent increase over 2Q 2010. The

company’s success was driven by international revenue. Its spinal business reported 4 percent decrease in biologics due to poor sales of Infuse.

Orthofix reported 3Q net sales of \$144.7 million, representing a 4 percent increase over 3Q of 2010. The company suffered a 1 percent decrease in spinal products, but growth in orthopedics & sports medicine.

Revenue was up for **Smith & Nephew** during 3Q, despite poor market growth from its orthopedics business. The company’s overall revenue increased by 10 percent to \$1 billion, but orthopedics sales only increased by 3 percent.

Stryker’s net sales showed a 14.9 percent increase during 3Q. The company reported \$2 billion in net sales, but net earnings decreased by 3

percent. The company’s spine business grew by 121 percent to \$184 million.

For the first time, **Synthes**’ quarterly revenue exceeded \$1 billion, an 11 percent increase over last year. The company experienced double-digit growth in the international markets.

Wright Medical Group reported a 3 percent decrease in net sales during 3Q to \$118.2 million. Domestic sales decreased by 7 percent while international sales only grew by 3.6 percent. Knee, hip and biologics sales decreased.

Overseas markets drove **Zimmer**’s 6.9 percent sales increase during 3Q. The company reported net sales of \$1 million, due to a 17 percent increase in the European market. The American market remained flat. ■

Low Cost Orthopedic Implants: 5 Things to Know About Buying at Wholesale Price

By Laura Miller

Until recently, the cost of orthopedic and spine devices wasn't inhibitory for providers, even though 700 percent mark-ups on these devices were the norm. Surgeons were able to select their preferred implants and payor reimbursement would cover the cost. However, with a recession at hand and incentives for lowering the cost of care, more surgeons are looking for high quality implants at the lowest cost; that's where small orthopedic and spine device companies like The Orthopaedic Implant Company come in, which offers implants to providers at their retail price.

"We founded the company about a year ago to meet the needs of surgeons who were frustrated with the high cost of orthopedic implants and our health-care system's inability to pay for [them]," says Itai Nemovicher, president and co-founder of The Orthopaedic Implant Company. "If we tried to do this five years ago, it probably wouldn't have worked out, but now as physicians and hospitals are forced to align their interests, part of which is cost containment, there is a lot more care on the surgeon's side to use cost-effective implants."

Additionally, more orthopedic and spine surgeons are taking their cases out of the hospital and into an outpatient setting. Surgeons who are owners in ambulatory surgery centers also have a heightened awareness of the costs associated with care and are always looking for ways to increase profitability without compromising patient care.

Despite the cost-savings, not all surgeons have been quick to adopt lower-cost implants from companies like OIC, because the lower cost is balanced by eliminating the sales representative position. Sales representatives from most companies strike the deal, stock the implants and sit in the OR in case the surgeon needs assistance during the procedure; at OIC, none of those services are available.

"There's no handholding in what we are doing, but the majority of the products in our current portfolio are for procedures surgeons shouldn't have trouble performing themselves," Mr. Nemovicher says. "There needs to be a paradigm shift in the culture of the OR where surgeons and hospitals are a little less sales representative-dependent before we can expand our portfolio to include more advanced products."

OIC isn't trying to replace sales representatives entirely, Mr. Nemovicher says; instead, they are looking for a way to provide affordable implants for cases where surgeons may not need assistance. Sales representatives still have a place in the device company-physician relationship under the retail pricing model, but it's more educational than ancillary. "There will always be a need for assistance with new innovative techniques and implants and I think large medical device companies play a big role in innovation and surgeon education," he says.

Here are five things surgeons and hospitals need to know about transitioning to retail implants:

1. Retail-price implants meet industry quality standards.

Retail priced implants are held to the same regulatory standards as large device companies and must comply with the same quality standards before being released in the market. Mr. Nemovicher says OIC implants are independently biomechanically tested against

industry-standard devices to make sure they are comparable. "We make the results from our biomechanical data available to physicians," he says. "We offer the lowest cost implant available without compromising on quality."

2. Surgeons can still use brand implants for cases.

Just because surgeons decide to contract for retail implants doesn't mean they can't use brand implants for their cases. Using both retail-priced implants for routine cases in combination with name brand implants for complex cases can yield profitability. "By utilizing lower-cost implants on commodity type products, surgeons open up the availability of using higher cost products in special cases that may have been a strain before," says Mr. Nemovicher.

3. The OR can still run without device representatives.

The transition to using implants and stocking inventory independently may be a challenge at first, but will save money in the long run, says Mr. Nemovicher. If the hospital has a strong staff and surgical tech team, the transition can be made with relative ease. "Some hospitals are able to handle the responsibility of controlling inventory and making sure the right instruments are available for the surgeons," he says. "Some are not, and in those cases retail-priced implants may not be for them."

4. Retail pricing can make Medicare cases more profitable.

Medicare has notoriously low reimbursement rates, but implant companies still charge the same price per implant regardless of the payor. Since retail implants are already available at a lower cost, they can make Medicare cases more affordable for providers. "Right now, we are focusing strongly on devices for hip fractures, which are common among older patients who have Medicare," says Mr. Nemovicher. "If we can save money for hip fracture patients, that's a big benefit to the system."

5. There should be common goals between implant companies and providers.

Healthcare providers and implant companies should have the same goal — to provide the best care possible for patients, says Mr. Nemovicher. However, in today's market that isn't always the case; the cost of implants is rising significantly, leaving some patients without the ability to undergo elective treatment.

"The rising costs of implants are outpacing our system's ability to pay for them," he says. "If OIC can contribute to the driving down of the cost of implants, we have accomplished our mission. We want to do what is best for physicians and hospitals, but our primary goal is doing what is best for patients." ■



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25 Orthopedic Surgeons on the Move

By Laura Miller

Columbia Memorial Hospital in Astoria, Ore., recently welcomed **Douglas Abbott, MD**. Dr. Abbott has a professional interest in shoulder and knee arthroscopy.

Two orthopedic surgeons, **Michael T. Lu, MD**, and **Cristobal Beiro, MD**, recently formed Garden State Bone & Joint Specialists in Woodbridge, N.J., and joined the Human Motion Institute at Raritan Bay Medical Center.

Michael E. Billhymer, MD, an orthopedic traumatology specialist, joined Great Plans Orthopaedics in Peoria, Ill. He completed his fellowship at Florida Orthopaedic Institute and Tampa General Hospital.

Orthopedic and spine surgeon **Adam Cabalo, MD**, recently joined the physicians at Wailuku Clinic in Maui, Hawaii. He completed a fellowship at Spine Care Medical Group in Daily City, Calif.

Foot and ankle specialist **Michael Campbell, MD**, recently joined Atlantic Orthopaedic Specialists in Chesapeake, Va. He completed his fellowship at Penn State Milton Hershey (Pa.) Medical Center.

Duluth (Minn.) Clinic recently welcomed **Joseph Signorelli, MD**, a joint replacement surgeon, and **Xan Courville, MD**, a foot and ankle specialist.

A. David Davis, MD, a sports medicine physician, joined The Physicians of Access Sports Medicine & Orthopaedics in Exeter, N.H. He earned his medical degree at Loma Linda (Calif.) University School of Medicine.

Brian Duggan, MD, an orthopedic sports medicine physician, recently joined Verde Valley Orthopedic Associates in Cottonwood, Ariz. He completed his fellowship in sports medicine at Barton Health in South Lake Tahoe, Calif.

Sports medicine specialist **Kevin Forsythe, MD**, recently joined Twin Cities Community Hospital in Templeton, Calif. He completed his residency at Loyola University Medical Center in Maywood, Ill.

The Shoulder & Elbow Center at OrthoCarolina in Charlotte, N.C., recently welcomed **Nady Hamid, MD**. He completed his fellowship in shoulder and elbow surgery at Washington University in St. Louis.

Joint replacement surgeon **Michael F. Harrer, MD**, joined Rothman Institute at its Voorhees, N.J., office. He previously served as joint director at Our Lady of Lourdes in Camden, N.J.

Northwest Georgia Orthopedics and Sports Medicine at Gordon Hospitals in Calhoun recently welcomed **Andrew Hester, MD**. He earned his medical degree at Medical College of Georgia.

Brooke Hunter, MD, has joined Veterans Affairs Montana Health Care System and will begin working there part time in November. He earned his medical degree at Northwestern University Medical School in Chicago.

Foot and ankle surgeon **O.B. Idusuyi, MD**, sports medicine specialist **Lucas S. Rylander, MD**, and orthopedist **Karolyn Senica, MD**, all joined St. Francis Hospital in Litchfield, Ill.

Oswego Hospital welcomed **Shawn Mills, MD**, an orthopedic surgeon. He earned his medical degree at the University of Texas Medical Branch at Galveston.

Shoulder and elbow specialist **Robert Morgan, MD**, recently joined OrthoCarolina. He completed his fellowship in sports medicine and shoulder and elbow surgery at OrthoCarolina.

Scott O'Neal, MD, also joined OrthoCarolina. Dr. O'Neal completed a fellowship in sports medicine and upper extremity reconstruction at OrthoCarolina.

Anastasios Papadonikolakis, MD, a shoulder and elbow surgeon, recently joined Southeastern Regional Medical Center in Lumberton, N.C. He completed his fellowship at Washington University in Seattle.

Kevin Thompson, MD, a sports medicine specialist, has opened an office at Bryan W. Whitfield Memorial Hospital in Demopolis, Ala. He completed his fellowship at OrthoCarolina.

Kaiser Permanente Hawaii recently welcomed **Eugene Toney, MD**, a practicing orthopedist. Dr. Toney received advanced orthopedic training at Indiana University, Massachusetts General Hospital and Women's Hospital in Boston.

OrthoMaryland in Baltimore recently welcomed **Chad Zooker, MD**, a sports medicine specialist. He earned his fellowship at Rothman Institute and Thomas Jefferson Hospital in Philadelphia. ■

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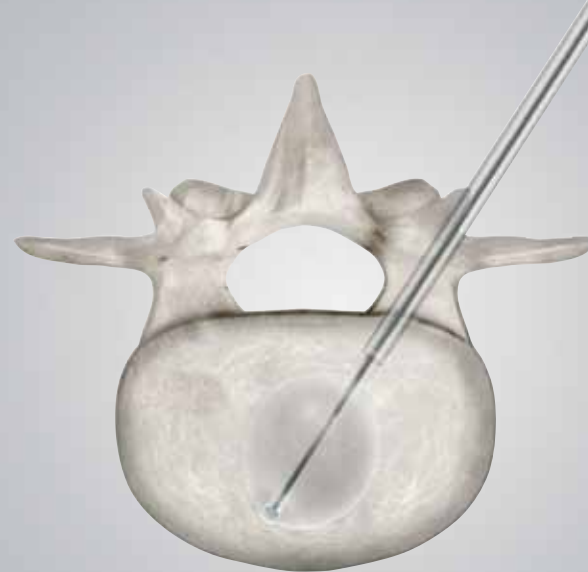
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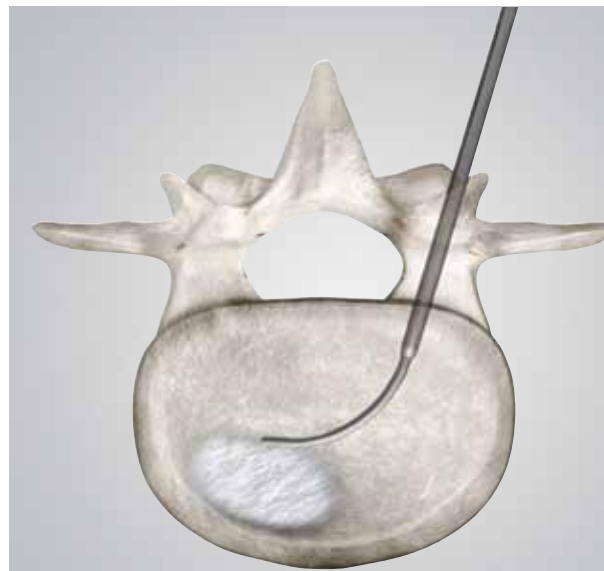
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