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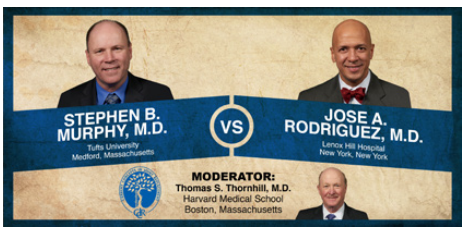
Orthopedics This Week

WEEK IN REVIEW



BREAKING NEWS

For all news that is ortho, read on.

Orthopedic Power Rankings

Robin Young's Entirely Subjective Ordering of Public Orthopedic Companies

THIS WEEK: China taking action to stimulate its economy. The People's Bank of China cut the reserve requirements for banks to 18.5%. That move will have the effect of pumping more cash into China's economy. Not surprisingly, MicroPort—the purest play in China Medical Devices—is up an impressive 20%.

RANK	LAST WEEK	COMPANY	TTM OP MARGIN	30-DAY PRICE CHANGE	COMMENT
1	4	Stryker	11.52%	(0.66%)	SYK is too cheap. In fact it is the 2nd least expensive equity in orthopedics. Why? No good reason. So #1 this week
2	3	Orthofix	7.46	14.67	Investors are expecting more good news from OFIX as 2015 unfolds. At these prices OFIX price to sales still very low.
3	5	Medtronic	28.84	(1.44)	Medtronic Spine's expanded indication for Vertex in full display at ISASS last week. MDT quietly but firmly on the rise.
4	1	Integra LifeSciences	12.57	(0.13)	After rising 50% these last few months, investors are taking some profits. Next big event is SeaSpine spin off.
5	8	MicroPort Scientific	16.53	20.61	Rocking on news of Chinese stimulus. But very little news about its ortho recon business.
6	6	Zimmer	29.12	(3.86)	Closing date for Biomet purchase extended to July 23nd. This is one slow motion deal.
7	7	Johnson & Johnson	28.44	(1.85)	DePuy's 1Q15 results were disappointing. Recon and trauma did best, up 2 and 3%, respectively. But spine fell 3%
8	10	Alphatec	0.33	2.88	ATEC about to report first quarter results and the expectations are modest. May be a set up for upside surprise.
9	2	Exactech	10.44	1.78	Management is guiding to a much lower sales and earnings number than originally expected for Q1.
10	NR	Globus Medical	30.82	0.20	Agrees to acquire Branch Medical.Increasingly active business development. Back on Power Rankings.

Robin Young's Orthopedic Universe

TOP PERFORMERS LAST 30 DAYS

	COMPANY	SYMBOL	PRICE	MKT CAP	30-DAY CHG
1	MicroPort Scientific	853	$0.57	$809	20.61%
2	Orthofix	OFIX	$36.58	$686	14.67%
3	Bacterin Intl Holdings	BONE	$4.19	$28	13.24%
4	K2M Group Holdings	KTWO	$23.11	$915	11.53%
5	RTI Biologics Inc.	RTIX	$5.70	$326	7.75%
6	Aurora Spine	ASG	$1.10	$21	3.96%
7	Alphatec Holdings	ATEC	$1.43	$143	2.88%
8	TiGenix	TIG.BR	$0.73	$118	2.08%
9	LDR Holding Corp.	LDRH	$37.51	$996	1.79%
10	Exactech	EXAC	$24.52	$342	1.78%

WORST PERFORMERS LAST 30 DAYS

	COMPANY	SYMBOL	PRICE	MKT CAP	30-DAY CHG
1	NuVasive	NUVA	$41.55	$2,001	-9.77%
2	ConMed	CNMD	$48.29	$1,333	-6.12%
3	CryoLife	CRY	$9.91	$280	-4.62%
4	Zimmer Holdings	ZMH	$114.61	$19,484	-3.86%
5	Tornier N.V.	TRNX	$25.92	$1,270	-2.04%
6	Johnson & Johnson	JNJ	$99.58	$276,888	-1.85%
7	Wright Medical	WMGI	$25.88	$1,329	-1.67%
8	Medtronic	MDT	$76.49	$109,003	-1.44%
9	Stryker	SYK	$92.50	$35,055	-0.66%
10	Integra LifeSciences	IART	$59.87	$1,962	-0.13%

LOWEST PRICE / EARNINGS RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	P/E
1	Johnson & Johnson	JNJ	$99.58	$276,888	16.82
2	Globus Medical	GMED	$24.85	$2,353	19.03
3	Medtronic	MDT	$76.49	$109,003	19.13
4	Zimmer Holdings	ZMH	$114.61	$19,484	19.64
5	Exactech	EXAC	$24.52	$342	20.96

HIGHEST PRICE / EARNINGS RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	P/E
1	MiMedx Group	MDXG	$10.17	$1,080	203.40
2	RTI Biologics Inc.	RTIX	$5.70	$326	107.99
3	NuVasive	NUVA	$41.55	$2,001	99.64
4	Orthofix	OFIX	$36.58	$686	91.88
5	CryoLife	CRY	$9.91	$280	45.89

LOWEST P/E TO GROWTH RATIO (EARNINGS ESTIMATES)

	COMPANY	SYMBOL	PRICE	MKT CAP	PEG
1	ConMed	CNMD	$48.29	$1,333	1.46
2	CryoLife	CRY	$9.91	$280	1.53
3	Globus Medical	GMED	$24.85	$2,353	1.57
4	Integra LifeSciences	IART	$59.87	$1,962	2.33
5	Medtronic	MDT	$76.49	$109,003	2.34

HIGHEST P/E TO GROWTH RATIO (EARNINGS ESTIMATES)

	COMPANY	SYMBOL	PRICE	MKT CAP	PEG
1	MiMedx Group	MDXG	$10.17	$1,080	13.56
2	NuVasive	NUVA	$41.55	$2,001	8.72
3	RTI Biologics Inc.	RTIX	$5.70	$326	7.20
4	Orthofix	OFIX	$36.58	$686	4.99
5	Smith & Nephew	SNN	$34.12	$15,279	4.48

LOWEST PRICE TO SALES RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	PSR
1	Alphatec Holdings	ATEC	$1.43	$143	0.69
2	Bacterin Intl Holdings	BONE	$4.19	$28	0.79
3	RTI Biologics Inc.	RTIX	$5.70	$326	1.24
4	Exactech	EXAC	$24.52	$342	1.38
5	Orthofix	OFIX	$36.58	$686	1.68

HIGHEST PRICE TO SALES RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	PSR
1	TiGenix	TIG.BR	$0.73	$118	14.09
2	MiMedx Group	MDXG	$10.17	$1,080	9.14
3	LDR Holding Corp.	LDRH	$37.51	$996	7.45
4	Medtronic	MDT	$76.49	$109,003	6.22
5	K2M Group Holdings	KTWO	$23.11	$915	5.81

PSR: Aggregate current market capitalization divided by aggregate sales and the calculation excluded the companies for which sales figures are not available.

Goodbye SGR, Hello MIPS and APS

BY WALTER EISNER

The SGR is dead. Long live MIPS and APS.

On April 14, 2015, politicians in Washington finally gave physicians what they've been asking for—legislation to permanently repeal the sustainable growth rate (SGR) formula and ensure predictable Medicare payments into the future. But physicians had to pay a price—abiding by, as yet, unknown quality metrics that are recommended by physicians, but controlled by the Secretary of Health and Human Services.

Physicians bet on the devil they don't know because it was better than the devil they hated.

www.aoc.gov

Agreeing to quality measures in the legislation to get rid of the SGR wasn't such a big jump for physicians. That train had already left the station earlier this year as Centers for Medicare and Medicaid Services (CMS) announced it would dump the Fee-for-Service payment system for a Pay-for-Performance system before the end of the decade.

The plan represents one of the "biggest steps yet from the government to actively accelerate the transition from the traditional fee-for-service model to value-based care," Paul Keckley, managing director at the Navigant Center for Healthcare Research and Policy Analysis, wrote for *Hospitals & Health Networks*. "It's not just about replacing an unpopular physician compensation formula. It's about raising the stakes for clinically integrated networks of physicians, allied health professionals and their business partners to take on payer-sponsored risk."

With an hour to spare before a 21% cut to Medicare payments to physicians was scheduled to go into effect, the U.S. Senate sent the bipartisan bill to President Obama for his signature. The President signed it the next day in his garden without an official ceremony.

The President in the Whitehouse garden/whitehouse.gov

Broken Payment Formula

The 1990s-era SGR formula had been declared broken by every physician society in America. Physicians lobbied Congress for over a decade to repeal the formula which tied physicians Medicare payments to the overall rate of growth in the economy. When the economy slowed, Medicare spending grew and cuts were required.

For 17 years Congress annually overrode the mandatory cuts for fear that physicians would stop taking on new Medicare patients. Grandmas were held hostage on a yearly basis.

MIPS and APS

The SGR is being replaced by Merit-Based Incentive Payment Systems (MIPS) and Alternative Payment Systems (APS), which in theory are supposed to pay better physicians more money, paying for outcomes instead of procedures.

Physicians can choose to join MIPS or APS and receive quality scores. If their

scores are good, their reimbursement rates go up.

MIPS are a kind of "Pay-for-Value Lite," by layering some bonuses (and some penalties) on top of a system that still pays physicians a set amount for each medical service.

But the real action is in APS, which is why the law offers an immediate 5% carrot bonus on top of all the other Medicare payments to physicians to join up.

Risks and Rewards

APS are typically bundled payments that require a group of physicians to join together and take a lump sum of money to care for a certain group of patients. If they can provide the care for less—and hit certain quality metrics—they get to keep some of the leftover cash. Surgeons will have a financial incentive to spend less than their lump sum amount, but still spend enough to avoid costly revisions or hospital readmissions.

In short, physicians are assuming more risk for a chance to make more money. While the quality measure metrics will be determined by someone else, physicians will have more control over what they can offer patients on a case-by-case basis.

Significant Provisions

Stuffed into the 265 page bill are the following significant provisions:

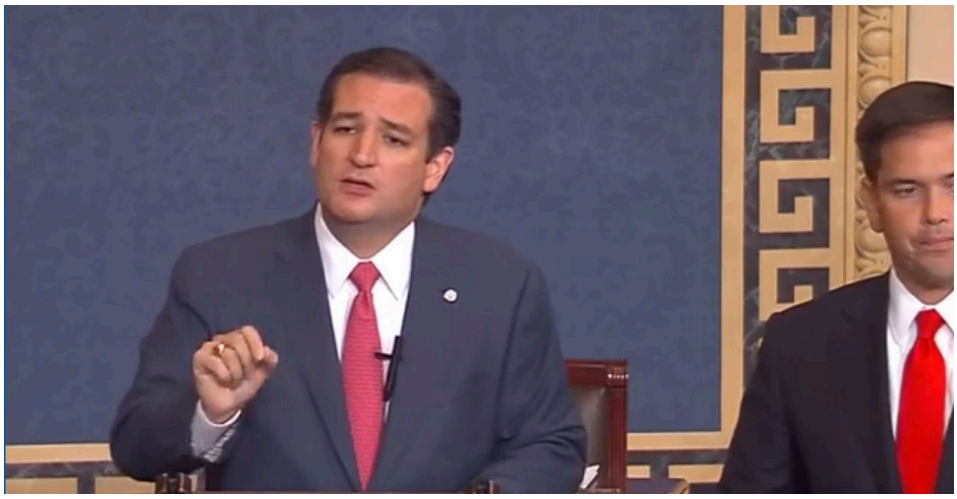
- Repeals the SGR and provides stability and five years of payment updates for physicians and providers while focusing payments on the quality, value, and accountability of care provider rather than simply the number of procedures.
- Extends for two years the Children's Health Insurance Program (CHIP) that provides comprehensive, affordable health care to 8 million children nationwide.
- Removes the imminent threat of cuts to Medicare providers and ensures a five-year period of annual updates of 0.5% to transition to the new system.
- Incentivizes care coordination efforts for patients with chronic care needs.
- Extends the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program.
- Provides a two-year extension of Secure Rural Schools.
- Reverses the 21% SGR cut that went into effect on April 1.
- Current quality incentive and payment programs are consolidated

and streamlined into a new Merit-based Incentive Payment Program (MIPS), and the aggregate level of financial risk to practices from penalties has been mitigated in comparison to current law.
- Physicians in alternative payment models (APM) receive a 5% bonus from 2019-2024.
- Strong incentives are created for physicians to participate in a qualified Patient Centered Medical Homes (PCMH). Physicians in qualified PCMHs will get the highest possible score for the practice improvement category in the new MIPS program. PCMHs that demonstrate the capability to improve quality without increasing costs, or lowering costs without harming quality, can also qualify as an APM without having to accept direct financial risk.
- Technical support is provided for smaller practices, funded at $20 million per year from 2016 to 2020, to help them participate in APMs or the new MIPS program.
- Funding is provided for quality measure development, at $15 million per year from 2015 to 2019. Physicians retain their preeminent role in developing quality standards.

David A. Fleming, M.D., MA, MACP, President, American College of Physicians (ACP) said we are witnessing something "quite extraordinary and historic" and transitioning us to a new value-based system.

Legislative Kabuki Theater

The fix wasn't free or cheap and caused eight U.S. Senators, including presidential candidates Marco Rubio of Florida and Ted Cruz of Texas, to vote against the physicians.



L to R: Ted Cruz and Marco Rubio/youtube.com/watch?v=5MM01NrC7bc

The new law wasn't fully paid for, with policy changes governing Medicare beneficiaries and providers paying for only about $70 billion of the approximately $210 billion package. The Congressional Budget Office has said the bill would add $141 billion to the federal deficit.

Cruz, the junior senator from Texas and a leader of a group of Senators that shut down the government a couple of years ago over Obamacare, said the new law "institutionalizes" Obamacare and will add about $500 billion to the deficit over the next decade.

Paying for Value

The biggest challenge of the new law will be to figure out exactly how to pay physicians for "value." The law doesn't say anything about what quality metrics will be used to gauge whether physicians are good or bad—or what counts as an alternative payment model.

"It's way easier in Congress to get agreement on general principles than on details," says Mark McClellan, who directs the Health Care Innovation and Value Initiative at the Brookings Institution. He previously ran the Medicare program under President George W. Bush. "That means a lot is going to hinge on how this and future administrations implement the law."

The federal government will be required to use quality indicators that physician groups suggest to the health and human services secretary. The secretary can add her own metrics to the list—but doctors are then free to pick and choose which metrics they want to be judged on.

"I'm very skeptical of this," Urban Institute Fellow Robert Berenson said in an interview with *Vox*. "It's really absurd that we don't have any measures for most doctors that can place a value on their performance."

Timeline to Metrics

By January 1, 2016, the HSS Secretary must develop and publish a draft plan for the development of quality measures for use in the MIPS and in APMs. The draft plan must take into account how measures from the private sector and integrated delivery systems could be used in Medicare and "how clinical best practices and clinical practice guidelines should be used" in developing quality measures.

The Secretary must prioritize:

(1) outcome measures
(2) patient experience measures
(3) care coordination measures
(4) "measures of appropriate use of services, including measures of over use."

The Secretary also must consider whether measures to be developed under these arrangements would be electronically specified and consider clinical practice guidelines (where they exist).

By May 1, 2017, and annually thereafter, the Secretary must report on the progress made in developing quality measures, including the number of measures developed, descriptions of the measures under development, a timeline for completion of such measures, and information on quality areas being considered for future measure development.

To carry out this mandate, the law authorizes up to $15 million annually for 2015 through 2019.

Patrick Dunham, CEO of Currant Health, told *Forbes* that to better refine a value-based system, healthcare leaders must take several steps, including standardizing the definition of value, developing payment models geared toward positive outcomes and aligning stakeholder interest.

John O'Shea, a senior fellow at the Heritage Foundation who previously advised House Energy and Commerce Chairman Fred Upton, said, "The existing quality measures aren't relevant to what [doctors] do in their everyday practice. They don't result in better patient care. I think we're going to need better quality measures."

Let the Lobbying Begin

Whether or not the new funding formulas will work, will be up in the air for a while. The new payment system won't start until 2019, giving President Obama and his successor four years to sort out the devils in the details. All the K Street lobbyists and legislative staffs of medical societies who have made careers of getting rid of the SGR will now have a new mission of getting the government to accept their clients' definition of quality. ♦

Best Small Spine Meeting Got Better

BY ROBIN YOUNG

The "Castellvi Spine Meeting" is taking place in less than three weeks, (May 7, 2015). The meeting is named and continued in honor of Antonio Castellvi, M.D., who passed away unexpectedly just before the 2014 "Duck Key Meeting."

James B. Billys, M.D., is course director. While he continues Tony Castellvi's passion for education, debate and innovation, he is also putting his own stamp on the meeting.

This year's meeting will feature a cadaver lab, debates in the form of point counterpoint presentations, new faculty including neurosurgeons and grants for residents to attend. Indeed, about 30% of the faculty is new.

Courtesy of Hawks Cay Resort

Dr. Billys is the Affiliate Assistant Professor at the University of South Florida and is Director, Spine Fellowship at the Florida Orthopaedic Institute in Tampa.

The meeting is still in one of the best venues going for a small course—Duck Key, which is about midway between Miami and Key West.

In picking up the mantle from Dr. Castellvi, Dr. Billys hoped to build on the educational strengths of the meeting while also adding quite a few new speakers and bringing a strong emphasis on clinical problem solving.

The highlight, in addition to the cadaver labs, may well be the point counterpoint debates.

The Program

As the "Duck Key" meeting famously does, this year's program also kicks off with a solid discussion of biomechanics, but then quickly transitions to debates featuring some of the most experienced surgeons in the country.

Here are the two debates:

1. L4-5 Spondylolisthesis with
    a. Neel Anand, ,M.D., M.Ch. discussing Lateral Transpsoas and
    b. Jean-Jacques Abitbol M.D., FRCSC taking on TLIF (Transforaminal Lumbar Interbody Fusion.)

2. Lumbar Facet Cyst with
    a. William Welch M.D. discussing 1o fusion and
    b. Scott Webb, M.D. taking on Laminectomy

Cadaver Labs

Each day's educational sessions end with cadaver labs.

At the end of the Thursday sessions, the cadaver labs will cover OLIF (Oblique Lumbar Interbody Fusion) and L5. At the end of the Friday sessions, the cadaver lab will cover cervical TDR (total disc replacement) and cortical screws.

So, after a morning of deep-diving into the anatomy of L4-5 and L5-S1 fusion, expandable cage technology, osteoporosis and 2nd fractures, planning sagittal coronal balance, anterior reconstruction, complications with deformity and prevention of junctional kyphosis—attendees can top the morning off with a cadaver lab!

Lunch, then it's swimming, fishing or just relaxing in the Florida Keys.

That's Day One.

On Day Two, the morning opens with a discussion of the cellular biologics of

the spine, clinical experience with past and present clinical trials, current evidence on cellular biologics and future directions in biologics. Then ANOTHER cadaver lab!

Lunch, swimming, fishing and relaxing.

It really does not get much better than this.

The Faculty

Among the speakers are faculty and department chairs from the following teaching institutions:

- Hospital for Special Surgery, New York
- University of South Florida
- University of Miami
- Duke University
- Cedars-Sinai Medical Center
- University of California San Francisco
- University of Georgia
- University of Pittsburgh
- University of California San Diego
- Brown University
- The Feinstein Institute for Medical Research
- Texas Back Institute
- University of Pennsylvania
- Drexel University College of Medicine
- New York University

Course Objectives

Surgeons and non-operative clinicians who attend can expect to leave having achieved the following objectives:

- **Assess and Critique** emerging techniques in comparison to current treatment options
- **Discuss** biomechanics in both cervical and lumbar spine and how fusion affects motion
- **Understand** the use of minimally invasive surgical approach in spine surgery
- **Employ** useful surgical techniques to avoid complications in spine surgery
- **Demonstrate** concepts learned in robotic spine technology
- **Apply** decision making strategies for complex cervical and lumbar degenerative disc

What Makes the Duck Key Meeting Unique

The Duck Key meeting is a small meeting—meaning that all attendees and presenters have the luxury of time and availability. What makes it unique is the focus on education and follow through in the form of many opportunities to discuss topics with some of the leading researchers and surgeons in the U. S. Want more discussion of MIS or com-

Courtesy of Hawks Cay Resort

plications or biologics or biomechanics? Here are the experts with plenty of time to review and discuss.

Then there is the venue. The Florida Keys and family friendly Hawks Cay Resort.

Hawks Cay

Hawks Cay is a luxury resort that is also an outstanding family vacation destination. Pictures do not do the resort justice. Located midway down the Florida Keys on the tropical 60-acre island of Duck Key, the area offers some of the world's best fishing; exciting water sports; dolphin interaction programs; a saltwater lagoon; five gorgeous swimming pools; and a variety of luxurious accommodations, including guest rooms, suites and villas.

So, for all of these reasons, I've always recommended the Duck Key meeting. This year, more than any other, I heartily encourage all of our readers—surgeons, nurses, tech, sales people and physicians who deal with back pain—to come to Duck Key on May 7 and experience one of the most rewarding small meetings in spine.

For more information and to register, go to this website: https://www.foreonline.org/2015-castellvi-spine. ◆

IL-6 Diagnoses Shoulder Infection? That's Interesting! // New Anterior Osteotomy Technique: Less Blood and Less Time // Especially Aggressive RA Affects Diabetics

BY ELIZABETH HOFHEINZ, M.P.H., M.ED.

Testing for Shoulder Infection: IL-6, α-defensin Look Promising While surgeons can readily identify a periprosthetic joint infection (PJI) following hip or knee surgery, it's not always so easy when it comes to the shoulder. In the first study of its kind, Eric Ricchetti, M.D., an orthopedic surgeon with the Cleveland Clinic, worked with colleagues and dug deeper into the use of α-defensin and Interleukin 6 (IL-6) to diagnose such infections. He tells *OTW*, "We are accustomed to seeing draining wounds and obvious signs of infection commonly accompany PJI in large joints, but this type of infection after shoulder replacement surgery typically occurs with a weaker clinical presentation. The most common bacteria seen in the shoulder—Propionibacterium acnes (P. acnes)—is challenging because its presence doesn't show up like a typical infection. The only symptom commonly seen is pain after the shoulder replacement surgery, which can be due to causes unrelated to infection. The surgeon is left asking, 'Is there a problem with the implant, or the rotator cuff…or is there an infection?' And the typical tests used to diagnose infection often come up negative because it's such a weak bacteria. Often the bacteria is not identified until after the patient has undergone a revision surgery."

"We conducted two studies in which we evaluated the synovial fluid of shoulder replacement patients: one looking at IL-6 and another examining α-defensin. We found that IL-6 is more sensitive and specific than standard preoperative testing for predicting positive cultures in revision shoulder replacement surgery—even with P. acnes. The sensitivity of IL-6 was 87% and the specificity was 90%. The tests we typically use have a sensitivity and specificity that is often below 50%. As for α-defensin, it had a sensitivity of 63% and a specificity of 95%."

"We are now looking at a larger group of biomarkers in synovial fluid to see if together, they can provide even better insight into diagnosing infection. The work we have done to this point seems to indicate that several markers together does make for a more predictive test."

"Synovial fluid α-defensin is more sensitive and specific than current preoperative testing for predicting positive cultures in revision shoulder replacement surgery. Increasing diagnostic accuracy of shoulder PJI will lead to improved decision-making regarding treatment, which will ultimately optimize clinical outcomes. These findings suggest that synovial fluid α-defensin may be an appropriate alternative, or an adjuvant, in identifying infection in the preoperative work-up of patients with a painful shoulder replacement."

"The better job we can do of diagnosing an infection, the better job we can do at determining what the best surgi-

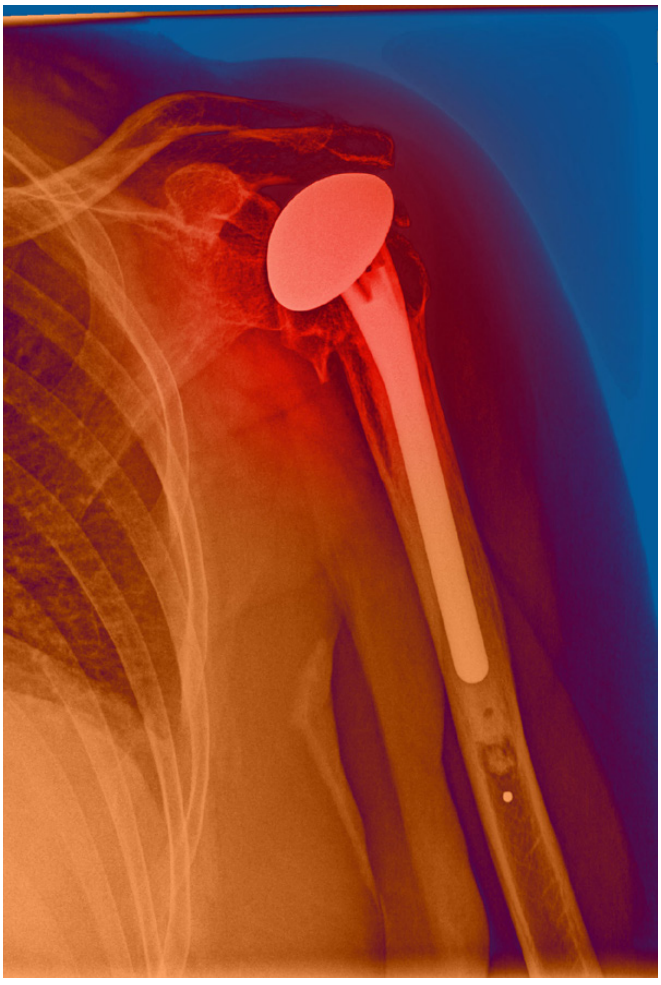


Photo Creation by RRY Publications, LLC/ Lucien Monfils & Wikimedia Commons

cal treatment should be. There is the fundamental decision, for example, of whether to do a one-stage or two-stage revision surgery."

Anterior Osteotomy: Less Blood and Fewer Minutes in the OR Less bleeding and everyone is in the OR for a shorter amount of time…what's not to like? In what amounts to an advancement for patients suffering from cervical deformities, Dan Riew, M.D., an orthopedic surgeon with Washington University in St. Louis, soon to join the faculty at Columbia University in New York City, has developed a new technique for anterior osteotomy. He tells *OTW*, "Because of this new technique, I almost never do posterior osteotomies anymore for kyphotic or kyphoscoliotic deformities. Even when the patient's chin is on his or her chest, it is surprising, but we can usually get in from the anterior aspect to do the osteotomy. Then, we stabilize from the back. Occasionally, we may have to finish the correction with further posterior osteotomies. But usually, that is not necessary. We've even had success in patients who have posterior instrumented fusions. This allows us to do a two stage—instead of a three stage—operation."

Han Jo Kim, M.D., an orthopedic surgeon with Hospital for Special Surgery in New York, analyzed the results of all of Dr. Riew's cases. He notes, "Osteotomy options for the cervical spine have to date included Ponte, Pedicle Subtraction, Smith-Petersen and Simmons. We describe a new technique that allowed Dr. Riew to achieve similar corrections in alignment compared to pedicle subtraction osteotomies, with less blood loss and similar operative times. For the Riew anterior osteotomy, thorough knowledge of the vertebral artery anatomy is critical for executing a safe and successful operation. In our paper, we describe methods for protecting the vertebral artery and the importance of pre-operative imaging of the vertebral arteries to recognize their precise location."

Asked what kind of underlying conditions might make this an unwise approach for a given patient, Dr. Kim told *OTW*, "This approach may not be the best for someone who has vertebral artery anomalies that make this approach more difficult and if a patient is so deformed with a rigid chin on chest deformity that makes it impossible to access the anterior cervical spine. In addition, patients who have a history of extensive retropharyngeal surgery with significant scar formation may make this approach less favorable."

"Special" Kind of RA for Diabetics What's *worse* than rheumatoid arthritis

(RA)? A horrific type of arthritis that occurs with diabetes, called neuroarthropathy, says Lew Schon, M.D., director of foot and ankle services at MedStar Union Memorial Hospital in Baltimore. Dr. Schon, past president of the American Orthopaedic Foot and Ankle Society, tells *OTW,* "My colleague and chief scientist Dr. Zijun Zhang and I are looking into a particularly destructive type of arthritis that affects patients with diabetic neuropathy. Worse than RA, with this condition the results are structural and functional disintegration of the bones, joints, ligaments and tendons. Because it's unclear what exactly is driving this problem, we have undertaken a series of studies and have thus found that the fibroblast-like synovial cells (FSC) in diabetic patients are aggressively making chemicals that break down the bone, cartilage and soft tissues. There are an especially high number of these FSCs in the joints of diabetics, and most impressively they are aggressive due to the absence of nerve ending produced neurotransmitters. This makes sense since we have stained the nerve endings of the diabetic joints and found out that they are depleted of nerves."

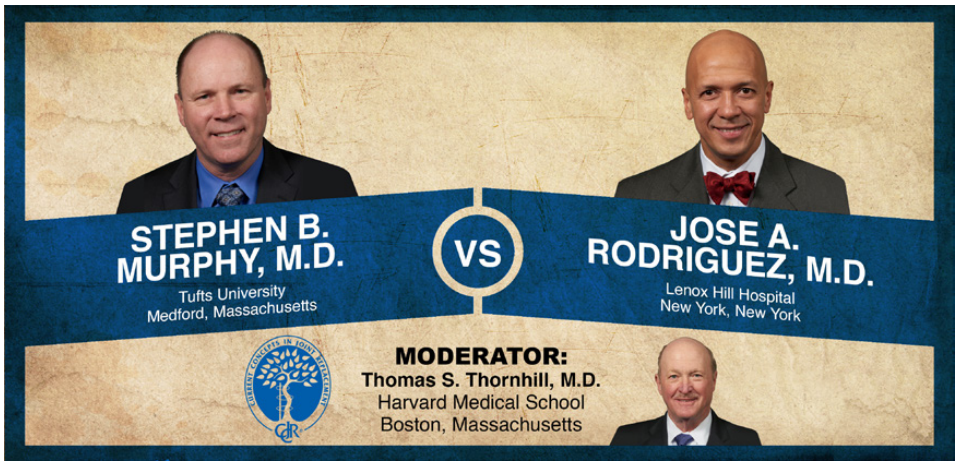
"Interestingly, when we introduce the chemical produced by the nerve cells, the FSC are controlled and they become more passive. So, when you have these FSC cultured in the presence of normal cartilage and you add a neurotransmitter, instead [of] chewing up cartilage, it remains intact.

"When I do a reconstruction on one of these patients I remove the damaged joint and send tissues to the lab; there we have the chance to look into all the joint elements involved in this pathology and identified these FSC and seen their aggressive functioning. The big picture is that half of the 29 million diabetics in the U.S. have neuropathy and probably up to 0.8-7.5% of those diabetics with neuropathy of have this bad arthritis. Now we want to see if we can develop biologic ways to stop the disease from progressing. To that end we will look into the development of this disease and dissect the complex interplays of diabetes, neuropathy and arthritic pathology." ♦

Murphy, Rodriguez Debate Superior Capsulotomy

BY ELIZABETH HOFHEINZ, M.P.H., M.ED.

"With superior capsulotomy there is no fluoro or X-ray required, there is more accurate component placement, and it's extensile," argues Stephen Murphy. "And there is a 23% lower cost over 90 days." Jose Rodriguez counters, "The major reason why this hasn't spread is that you have to buy into navigation. Then there is technical ability; it's a very different technique. It's quirky, and you lose tactile feedback."



Current Concepts in Joint Replacement/RRY Photo Creation

This week's Orthopaedic Crossfire® debate was part of the 31st Annual CCJR – Winter meeting, which took place in Orlando this past December. This week's topic is "Superior Capsulotomy: The Ideal Approach for THA." For the proposition is Stephen B. Murphy, M.D. of Tufts University. Jose A. Rodriguez, M.D. of Lenox Hill Hospital in New York is in opposition. Moderating is Thomas S. Thornhill, M.D., Harvard Medical School.

Dr. Murphy: "In 2002 when we were developing this there were a few principles that we were trying to adhere to: Do the hip surgery without having to dislocate the hip; preserve the abductors, short rotators, and posterior capsule; be able to transition this into a traditional exposure if necessary; be able to perform a trial reduction; eliminate the need for intraoperative fluoro or radiography; be able to use a standard OR table; be able to do it in the vast majority of patients; and allow unrestricted progression of activity."

"With superior capsulotomy the patient is in a lateral position and the incision is a little proximal to the tip of the greater trochanter. The fascia is incised and bluntly spread. The back of the medius is identified and brought forward. The front of the piriformus is identified. This is the only structure that is incised. You can preserve it if you want, or repair it if you take it. Then the mimius is brought anteriorly to expose the superior hip joint capsule. A superior incision is made in the capsule and then turned a bit anteriorly. Then we place leverage retractors inside the capsule around the front and the back of the femoral neck."

"The femur is entered with the head in situ, and then we open the top of the neck with an osteotome to allow for preparation of the femur. We then leave a broach in to use as an internal neck cutting guide, and a saw is used to transect the neck. Then the head is levered, a Shans pin is placed, and then the head is removed. Then we place retractors front/back and anterior/superior, use an angled reamer, and a double angled cup impactor to place the cup...trial reduction. At this point I go to the front of the table, put a bone hook in the trial, and control the leg with my other arm. I then assemble the head onto the neck in situ. The hip should be fully stable in all positions. Once you confirm that, you put the liner and real stem in, and assemble in situ and close the capsule. This can also be done with straight instruments using a longer incision or a percutaneous portal."

"In 2006 we published that we had faster recovery and lower complications than with the transgluteal exposure I was using before. We've gotten to the point where almost 100% of primary hips can be done using this technique so that they're not selected in any way. And it's possible to use it in complex cases; in fact, dysplastic cases are a bit easier from this direction."

"Our complication rates reveal 0 deep infections and only 3 dislocations in almost 2,000 patients, despite the fact that we typically use relatively small bearings. Nerve injury is incredibly rare and usually resolves completely. And there were only two revisions for periprosthetic fracture."

"Virtually every major complication has a lower incidence with this technique as compared to the anterior technique.

In terms of cup position, if you look at anterior versus superior, Jose Rodriguez recently published that they had a 25% malposition rate with anterior exposures with fluoro. And there are several publications showing that we can easily get 98-100% if we use smart mechanical navigation in addition to the surgical technique."

"Regarding length of stay, at our hospital the superior technique has a statistically significant shorter length of stay by almost a whole day…despite the fact that these are unselected cases…whereas the anterior are selected cases. The only outpatients that we've done at our hospital to date are those with whom we've used the superior technique. Concerning cost, there is recent Medicare data showing that it's $5,100 less per case over a 90 day period (compared to all other hips from our database)."

"There are many positives, including that it's a safe operation that doesn't require intraoperative imaging or a special table…and you get much more accurate component placement. When it comes to total hip arthroplasty, anterior is not superior."

Dr. Rodriguez: "Merriam-Webster describes ideal as 'exactly right for every purpose, situation, or person.' Dictionary.com says it is, 'conceived as constituting a standard of perfection or excellence; existing only in the imagination.'"

"An approach should be easy and safe. You should be able to get consistent, high quality outcomes, and it should be reproducible/transferable. Stephen and I agree that this technique is tissue-preserving; there is no posterior capsule cut, no actual dislocation, and the femur is prepared in situ."

"In his published work, Stephen has shown that in early recovery patient outcomes are better compared to his transgluteal approach. He diminishes his abduction outliers, improves early recovery…and most importantly, in this transition his complication rate is less. There are fewer issues with greater trochanteric fracture because he's not taking the wafer off the trochanter. And Stephen developed a technique for creating precision leg length in terms of operating. The difference between what he thought he got with navigation and what he actually achieved was less than a millimeter on average."

"How does this technique compare to the industry standard? If we look just at the things happening at the New England Baptist, there is a significant difference in this cohort compared to the others in terms of length of stay (1.7

days for superior capsulotomy; 3.2 days for all others)."

"As for transferability/reproducibility, there are numerous good surgeons on the MicroPort website who are using this technique. I know most of these guys and they are really good surgeons. But they are still just out of the innovators and into the early adopters phase."

"Why is this not more widely adopted? First, it's not well marketed. If you Google 'superior capsulotomy' you get seven pictures. Effective marketing is one where that message is picked up by other venues and spread independently. Also, this is a multistep adoption process. It's a very different technique, and it's quirky; and you lose tactile feedback. To quote Stephen, he uses 'funny looking instruments' that go in differently. And broaching the femur in situ is very different."

"I think the major reason why this hasn't spread is that you have to buy into navigation because that's the technique he has developed to create reproducibility. Then there is technical ability. I measure transferability by how frequently a resident who leaves an institution adopts that technique."

Moderator Thornhill: "How many in the audience would use a superior capsulotomy approach or one of the other piriformus approaches? OK…I think I can count those. Steve, why is no one doing this?"

Dr. Murphy: "With the anterior exposure it's a good technique, not great, though. Going supine with a fluoro on a fracture table is dramatically more different than switching to a superior capsulotomy from a posterior exposure (which you can transition in and out of). And the anterior exposure is not extensile. When we were developing these techniques we had to create the instruments. It's different if you have a technique that is supported by a multi billion dollar company. People learning THIS technique are taking time out of their practices."

Moderator Thornhill: "Jose, your approach?"

Dr. Rodriguez: "I use the direct anterior approach (DAA) for about 95% of my cases; no navigation."

Moderator Thornhill: "Why do you think Steve's approach hasn't caught on more?"

Dr. Rodriguez: "Because you do need navigation, and that's a hard thing to buy into."

Moderator Thornhill: "Steve, why do you think the DAA has become so popular?"

Dr. Murphy: "I think it has to do with educational resources and industry support. Just in the past couple of years not only are there a lot of people using the instruments that I made years ago, but there are people calling it the northern exposure, the transpiriformus exposure, the direct superior exposure, etc. There are a million operations out there copying this and calling it different things, but they are based on the same principle. In the next couple of years there will be significant adoption of these techniques because they are better."

Moderator Thornhill: "Jose, what is your average length of stay for a DAA total hip?"

Dr. Rodriguez: "Anyone 60 and under tends to go home the next day. As you get into the 70s they tend to stay three days so they can go to rehab."

Moderator Thornhill: "David Lewallen has made a good point about letting people go with no crutches or anything and they go out and play tennis…it's almost like a badge of courage. We may be going overboard and trying to discharge people before they're admitted."

Dr. Murphy: "In the anterior, if you're cherry picking the cases then it's like hip resurfacing. Obviously the patients do better—even though it's a bigger operation—because you're operating on better patients. In this situation I'm not focused on length of stay…patients just feel better and they want to make their way to the door. And, we have $0 in readmission with this operation in the last 12 months of the Medicare database."

Dr. Rodriguez: "We've studied length of stay and found no difference between anterior and posterior patients…they were both diminishing. However, I insist that my patients use two crutches for two weeks because they will heal faster.

Moderator Thonrhill: "Thank you, gentlemen." ♦

Please visit www.CCJR.com to register for the 2015 CCJR Spring Meeting, May 17 - 20 in Las Vegas, Nevada.

COMPANY

New Staple Inserter Makes "Most Advanced" Claim

By launching the STAPix Superelastic Nitinol Staple Fixation System, Houston-based Instratek claims to be the first company to offer a "fully functional" sterile staple inserter.

In an April 9, 2015 press release, the company says the system is the "most advanced" device of its kind and enables extremity surgeons to "confidently control" staple arm width during insertion, removal, and repositioning if necessary.

The kits are sterile, single-use, and fully disposable. The system, according to the company, has numerous sizing options giving the surgeon flexibility in the forefoot, midfoot, hindfoot, and hand. "Our comprehensive kit configurations contain all the necessary components for a successful procedure including: implant, drill guide, drill bit, locating pins, inserter tool, and tamp," stated the press release.

The device is intended for orthopedic and podiatry surgery and is now available in the U.S. through the company's distributor-based sales force.

Instratek's other products include the Jones-FX, Mini Cannulated Titanium Headed & Headless Screw System, CMC Cable FIX, Endotrac-Endoscopic Carpal Tunnel Release System, Endoscopic Trigger Finger Release, Endoscopic Plantar Fasciotomy, Endoscopic Gastrocnemius Release, Endoscopic Decompression of the Intermetarsal Nerve, MABS (Michelanglo Bunion System), and Sub-Talar Lok arthroereisis implant.

The company has been making endoscopy and implants for the extremity market for 23 years. It changed ownership in June 2014 when its former president, Jeff Seavy bought the company. He began working for Instratek Incorporated, as the company was then known, in 2007. — *WE*

STAPix Fixation System/Instratek

Zimmer Extends Biomet Merger Deadline

The Zimmer Biomet deal may be delayed.

Zimmer Holdings, Inc. announced on April 13, 2015 that the "outside date" for completing the proposed merger with Biomet, Inc. has been extended to July 23, 2014. The company still expects the deal to close by the end of April or shortly thereafter.

The original agreement between the companies called for the deal to be completed by April 24, 2015. The agreement has an option for either party to extend the outside date for an additional 90 days if all the regulatory hurdles have not been cleared by the original date. Europe and Japan regulators have cleared the merger with provisions for the companies to divest some product lines. However, the merger has not yet been cleared by U.S. regulators at the Federal Trade commission (FTC) under the Hart-Scott-Rodino Antitrust Improvements Act.

Bob Hopkins of Bank of America said his research suggests that "no new issues have arisen" with U.S. regulators at the FTC. He remains confident in a "near term deal close." — *WE*

Creative Commons and RRY Publications

DePuy Synthes' First Quarter, Steady and Robot Deal With Google

Johnson & Johnson's (J&J) DePuy Synthes' reported revenue of $2.33 billion was down 3.8% in the first quarter of 2015. Excluding the 5.9% negative currency impact of a strong dollar, sales were up 2.1%.

Utilization Rates, Insured, Up

Company executives told analysts on April 14, 2015, that they saw a third consecutive quarter of sequential and year-over-year improvement in hospital utilization rates and are encouraged by the signs that the company is seeing in U.S. volumes. The government recently reported that about nine out of ten Americans now have health insurance.

Growing Sales

On a constant currency basis, hips were up 3% (2% in U.S.), knees up 1% (2% in U.S.) spine down 2% (down 4% in U.S.) and trauma up 3% (flat in U.S.).

The company acknowledged losing spine share in the quarter to smaller players. Trauma growth was driven by 7% growth outside the U.S. due to strong volume growth including a tender. Hip growth of 3% was driven by strong volume growth partially offset by continued pricing pressure. Primary stem platform sales were a major contributor to the results.

The increase in knee sales was due to strong sales of Attune. Outside the U.S. knees were down 1% with growth in Asia Pacific and Latin America offset by lower sales in Europe. Slowing elective procedure volume primarily in the U.K contributed to the soft sales in Europe.

DePuySynthes 1Q2015	Sales ($ in millions)	% Change
Total Reported Sales	**2,328**	**down 3.8%**
Knees		down 4.0%
Hips		down 3.0%
Spine		down 7.0%
Trauma		down 3.0%

Source: Johnson & Johnson

J&J, Google and Robots

There was interesting robotic news from J&J during the quarter with the announcement in March of a definitive agreement to collaborate with Google Life Sciences to advance development of a surgical robotics program. J&J's CFO Dominic Caruso said the company would expect this collaboration would take "a couple" of years to come to the market with the new type of robotic surgery that they think will "dramatically revolutionize surgery." — *WE*

DePuy Synthes COMPANIES OF Johnson & Johnson | Google

Courtesy of DePuySynthes and Google

LEGAL

DePuy Issues Safety Notice for LCS Knee System

DePuy Orthopaedics, Inc. issued a voluntary Field Safety Notice (FSN) for all lots of its LCS Complete RPS Knee System (LCS) this past March.

LCS Complete RPS Knee/DePuy Orthopaedics, Inc.

Higher Revision Rates

Australia's regulatory body, the Therapeutic Goods Administration (TGA), had recently notified the company that based on information from the Australian Orthopaedic Association National Joint Replacement Registry; the system has a higher rate of revision when the native patella is not resurfaced than other unresurfaced knee systems. In fact, almost four times the rate. At four years, the LCS had a 12.9% revision rate versus 3.6% of other systems, when the patella was not resurfaced.

According to data from the registry, failure to resurface the patella has been associated with a higher incidence of postoperative patello-femoral pain, potentially leading to a secondary procedure. As a result, the company is warning against use of the LCS system without resurfacing the native patella.

The units affected since 2006, according to the Notice, include, "15,571 LCS

COMPLETE RPS Femoral Implants and 17,732 LCS COMPLETE RPS Inserts sold in the U.S. and 3,263 LCS COMPLETE RPS Femoral Implants and 3,546 LCS COMPLETE RPS Inserts sold outside of the U.S."

This device correction does not affect any other LCS complete knee femoral implants or inserts.

Intended Use

The LCS system is intended for total knee replacement and consists of a femoral implant and the compatible LCS insert. The LCS system is indicated for cemented use in cases of osteoarthritis and rheumatoid arthritis. The RPS inserts and femoral implants are indicated where a higher than normal degree of post-operative flexion is required.

Corrective Action

The company said it is taking the following steps for this device correction:

1. Advise users to resurface the patella with any of the LCS knee patella implants when implanting the affected implants.
2. Revise product literature to include verbiage around the requirement to resurface the patella with any of the LCS implants when implanting the affected implants.
3. Remind users that product complaints should be reported through the normal complaint reporting process.

Clinical Implications

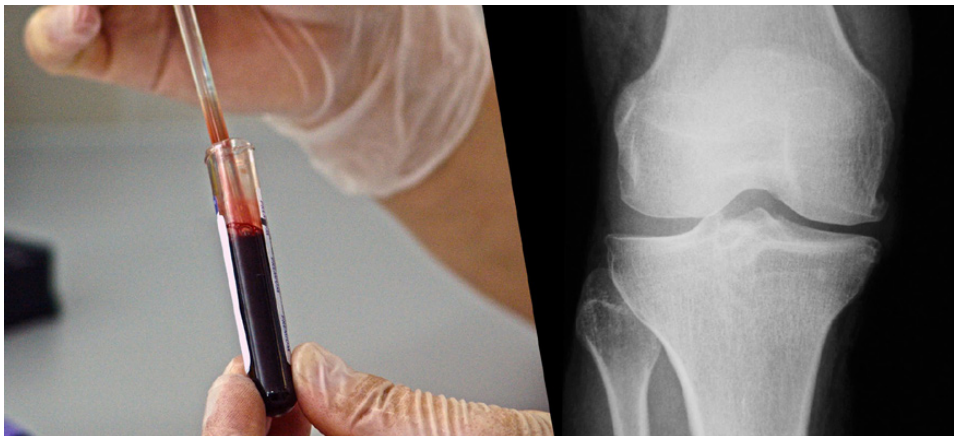
If the system is implanted and the native patella is not resurfaced, the company says the patient may experience patello-femoral pain, potentially requiring a secondary procedure. Following are examples of possible risks/hazards of secondary procedures:

1. Infection
2. Additional scarring
3. Neural and vascular damage
4. Additional pain to the patient
5. Functional problems resulting from items 1 – 4 above
6. Anesthesia-associated risks

DePuy is not recommending prophylactic revision in the absence of symptoms. The company recommends that surgeons discuss potential clinical implications and risks with symptomatic patients that received the system with an unresurfaced patella. — *WE*

LARGE JOINTS

Coming Soon: First Blood Test for OA



Wikimedia Commons and Nevit Dilmen

A blood test for arthritis is on the way, say researchers from the University of Warwick in the UK. The team, led by Naila Rabbani, Ph.D. of the university's medical school, has identified a biomarker linked to both rheumatoid and osteoarthritis.

The research team investigated what is known as citrullinated proteins (CPs), a biomarker thought to be present in blood of people with early stage rheumatoid arthritis (RA). Dr. Rabbani said in the March 20, 2015 news release, "It has been long established that the autoimmunity of early-stage RA leads to antibodies to CPs, but the autoimmunity, and hence antibodies, are absent in early-stage OA. Using this knowledge and applying the algorithm of biomarkers we developed provides the basis to discriminate between these two major types of arthritis at an early stage."

"Detection of early stage-OA made the study very promising and we would have been satisfied with this only—but beyond this we also found we could detect and discriminate early-stage RA and other inflammatory joint diseases at the same. This discovery raises the potential of a blood test that can help diagnose both RA and OA several years before the onset of physical symptoms."

Dr. Rabbani told *OTW*, "The most surprising for us was that high level of CP was present in people with OA. No one believed CPs were present in OA, maybe thinking that as antibodies to CPs were only in RA then CPs were limited to RA too."

Regarding future work, Dr. Rabbani commented to *OTW*, "This test is useful as a marker of disease activity in the early-stages of OA (before joint damage has occurred). Acting on this, likely beneficial lifestyle and dietary changes may be implemented to slow or stop development of advanced, disabling OA. Further research is required to confirm a link of these biochemical markers in early-stage OA to risk and rate of development of severe OA. When confirmed the test could also be a useful tool in studies of evaluating effectiveness of drug treatments in OA. A marker of early-stage OA may provide for much more rapid evaluation of prospective new drugs and identify for whom the drug works well to provide for personalised, effective treatment." — *EH*

Vitamin D Benefits Obese Patients With OA

Wikimedia Commons and Alex Proimos

Recent research from the University of Florida (UF) has found that individuals who are obese and have osteoarthritis (OA) can benefit from vitamin D. Specifically, higher levels of vitamin D may decrease pain and improve function in obese individuals with osteoarthritis.

"Adequate vitamin D may be significant to improving osteoarthritis pain because it affects bone quality and protects cell function to help reduce inflammation. Vitamin D maintains calcium and phosphate concentration levels to keep bones strong," said lead author Toni L. Glover, Ph.D. in the March 30, 2015 news release. Dr. Glover is an assistant professor in the UF College of Nursing, part of UF Health. "Increased pain due to osteoarthritis could limit physical activity, including outdoor activity, which would lead to both decreased vitamin D levels and increased obesity."

The researchers analyzed blood samples for 256 middle-aged and older adults, while participants self-reported on knee OA pain. The participants also completed functional performance tasks such as balance, walking and rising from sitting to standing. Among the 126 obese participants, 68 were vitamin D-deficient while only 29 of the 130 non-obese participants were deficient.

"Vitamin D is inexpensive, available over-the-counter and toxicity is fairly rare," Dr. Glover said. "Older obese patients with chronic pain should discuss their vitamin D status with their primary care provider. If it's low, take a supplement and get judicious sun exposure."

Dr. Glover told *OTW*, "We expected that vitamin D status would be associated with obesity as other research has supported that vitamin D is sequestered in fat cells and less available for its biological actions. The finding of most interest is that obese individuals with deficient or insufficient levels of vitamin D had poorer lower extremity functional performance (standing up from a seated position and walking a short course) than obese individuals with adequate vitamin D levels. Impacting function in older adults with OA is important to slowing the progression of the long-term sequelae of OA."

"This study is part of a larger trial examining ethnic/racial differences in osteoarthritis pain (*Ethnic Differences in Responses to Painful Stimuli* (R37AG033906), National Institutes of Health/National Institute on Aging Merit Award. PI: Roger B. Fillingim). The study is ongoing and we continue to examine the relationship of vitamin D status to OA pain and health disparities in pain. Ultimately, the goal is to supplement with vitamin D in a blinded design to assess the impact of correcting vitamin D deficiency. Other research findings in this area are equivocal." — *EH*

Study: Depression Increases Risk of Arthritis, Arthrosis

Researchers from Switzerland have found that individuals with depression are at a higher risk for physical diseases, especially for arthrosis and arthritis. Their results, based on data from 14,300 people living in Switzerland, have been published in the scientific journal *Frontiers in Public Health.* Roughly one-third of the participants suffering from depression also suffer from at least one physical disease. This association was evident especially with arthrosis and arthritis that are degenerative and inflammatory diseases of the joints.

A research group led by Professor Gunther Meinlschmidt from the Faculty of Psychology at the University of Basel and the Faculty of Medicine at the Ruhr-University Bochum analyzed the records of 14,348 subjects from the Swiss Health Survey.

According to the April 1, 2015 news release, the researchers are speculating that depressive symptoms result in a lack of interest in physical activity, which may then lead to joint diseases. They note that it could be the opposite, however, i.e., that people with joint disease are limited in their daily activities, which negatively impacts their mental health and ultimately results in depressive symptoms. The authors note that joint diseases are often caused by inflammatory processes, which have also been indicated in certain types of depressive disorders. Therefore, they say, inflammatory processes may represent the link between depressive symptoms and physical diseases.

"A better understanding of the association between depressive symptoms and physical diseases in Switzerland is the basis for a better health care provision for people suffering from mental disorders as well as physical diseases," said Professor Meinlschmidt.

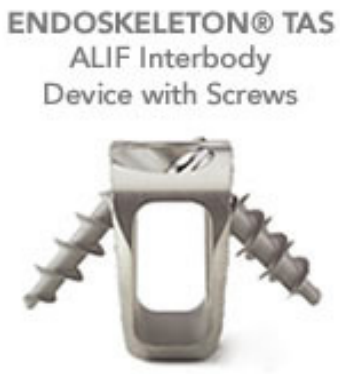
Professor Meinlschmidt told *OTW,* "What surprised us most was the fact that while we assessed numerous physical diseases, the clearest picture emerged for the association of depression with arthrosis and arthritis. We hope that our work helps increasing the awareness for putative depressive disorders in people suffering from joint diseases and vice versa." — *EH*

Pixabay

SPINE

Titan Spine: Our Interbody Devices Trump PEEK Devices

Titan Spine, LLC has announced that data from a study comparing its proprietary surface technology



Titan Spine, LLC

to polyetheretherketone (PEEK) have now been published in the March 15 print issue of *Spine.* According to the April 6, 2015 news release, the study found that "Titan's Endoskeleton Interbody Devices promote osteoblastic differentiation and enhanced bone-forming environment compared to devices made from PEEK. Specifically, the data show that fibrous tissue formation around PEEK implants may be due to the creation of an inflammatory environment." The study was honored with the 2014 Whitecloud Award for Best Basic Science Research from the Scoliosis Research Society.

Barbara Boyan, Ph.D., Dean of the School of Engineering at Virginia Commonwealth University, and lead author of the study said, "These results indicate that Titan's surface reduces production of inflammatory mediators and increases production of anti-

inflammatory mediators compared to PEEK, thus creating an enhanced environment for bone growth and fusion. Fibrous tissue formation around PEEK spinal implants is due to several factors including increased inflammatory cytokines and decreased cell viability. These data add to the growing body of medical knowledge supporting the use of titanium implants featuring a complex roughened topography at the macro-micro-nano (MMN) levels that induce healing on the cellular level where it is critical for early bone formation."

Titan Spine CEO Peter Ullrich, M.D., a former surgeon, commented, "This study is yet another example in a rapidly growing body of evidence that PEEK is a poor material for promoting bone growth. Until recently, PEEK was thought to be inert at best. We now understand that is not the case. Dr. Boyan's research demonstrates that PEEK is actually inhibitory to bone forming cells, called osteoblasts, through the upregulation of pro-inflammatory markers. This leads to fibrous tissue formation, rather than bone formation, as the body attempts to protect itself from PEEK through encapsulation. We were pleased when the IMAST [International Meeting on Advanced Spine Techniques] program committee recognized the importance of these data by granting it with the Whitecloud Award. Titan will continue to be at the forefront of scientifically engineering superior interbody fusion devices and promoting titanium as the preferred material for bone growth and fusion."

Dr. Boyan told *OTW*, "We were most surprised to learn that growth on the PEEK surface caused mesenchymal stem cells to produce such a different set of inflammatory factors and factors associated with cell death when compared to cells that were grown on the titanium alloy surfaces. We had expected cells on the rough Ti6Al4V surface to perform better than cells on the smooth surface, and that proved to be the case."

"It is important for orthopaedic surgeons to realize that this is a cell culture study and the overall health of their patient will have an impact on the success of the implant as well. However, these data do suggest that the fibrous connective tissue interface that occurs with PEEK implants may result from an inflammatory local environment." — *EH*

PEOPLE

Dr. Simpson Mason's Efforts Win AAOS 2015 Diversity Award

Bonnie Simpson Mason, M.D., has probably directly helped more than 1,000 female and minority medical students, residents and orthopedic surgeons over the past ten years through her nonprofit organization, Nth Dimensions Educational Solutions, Inc.

The American Academy of Orthopaedic Surgeons (AAOS) honored Dr. Simpson Mason for those efforts by awarding her the Academy's 2015 Diversity Award at its recently held annual meeting. The Diversity Award recognizes Academy members who have distinguished themselves through their outstanding commitment to making orthopedics more inclusive.

Recruiting and Supporting Women and Minorities

She was recognized for recruiting and supporting women and minority medical students interested in a career in orthopedics.

According to the Academy, Dr. Simpson Mason's organization has worked with the AAOS for more than a decade to develop and facilitate scholarship and internship programs for medical students from diverse backgrounds. Many of the students who participated in programs sponsored by Nth Dimensions credit those experiences as being the driving force behind their success in becoming orthopedists.

Filling Mother's Footsteps

Orthopedic surgery is predominately a male field. But that didn't intimate Dr. Simpson Mason, as her mother was a construction engineer. "I saw my mother do it every day. If you can see someone like you being successful, then your aspirations become feasible," she told *AAOS NOW.*

Bonnie Simpson Mason, M.D.

She attended the Morehouse School of Medicine in Atlanta and completed a general surgery internship at the University of California at Los Angeles, followed by an orthopedic residency at Howard University Hospital in Washington, D.C.

After five years in clinical practice at Grant Orthopaedic Bone and Joint

Surgeons in Washington, D.C., where she also served as the practice's chief financial officer, she was diagnosed with rheumatoid arthritis. She retired from surgical and clinical practice and founded Nth Dimensions by drawing on her entrepreneurial and leadership skills.

Nth Dimensions

Nth Dimensions attracts female and minority medical students through its physician pipeline initiatives. The organization partners with AAOS to offer first-year medical students the opportunity to participate in eight-week clinical and research internships as part of the Orthopaedic Summer Internship (OSI) Program. After they complete a research project, the students present their study findings at a national scientific meeting.

"The goal of the OSI program is to provide three important elements that contribute to increasing students' competitiveness for orthopedic residency positions: early exposure to the field of orthopedics, clinical and research experience, and ongoing mentoring and leadership development," said Dr. Simpson Mason.

One-Third of All African-American Residents

Approximately 175 students have been Nth Dimensions/AAOS Orthopaedic Summer Interns since the program's inception. In Dr. Simpson Mason's estimation, close to one-third of all African-American orthopedic residents have participated in at least one of Nth Dimensions' programs.

"As a direct result of her organization, Dr. Simpson Mason has fostered the careers of a small army of diverse physicians who will naturally strive toward a goal of providing culturally competent care," wrote former Nth Dimensions participant Rishi Balkissoon, M.D., MPH, chief resident in the department of orthopedic surgery at Johns Hopkins.

Changing the Face of Orthopedics

Claudia Thomas, M.D., the first African-American female orthopedic surgeon and recipient of the 2008 AAOS Diversity Award, nominated Dr. Simpson Mason. She wrote; "Dr. Simpson Mason has been a silent warrior in the effort to diversify the field of orthopedic surgery...She has devoted infinite time and energy to changing the face of orthopedics, not out of resentment of the specialty's exclusivity, but because she loves the field so much."

Dr. Simpson Mason credits Zimmer Holdings, Inc. for being a ten-year sponsor and the "life's blood of Nth Dimensions' ability to thrive." She also works with the J. Robert Gladden Society, the Ruth Jackson Orthopaedic Society, the American Association of Latino Orthopaedic Surgeons, and the National Medical Association. She is also a clinical assistant professor in the department of orthopedic surgery and rehabilitation at the University of Texas Medical Branch in Galveston, and an adjunct professor of graduate medical education at the University of Louisville School of Medicine.

"Receiving the AAOS Diversity Award confirms for me that my role and purpose is to motivate young people to become orthopedic surgeons," she told *AAOS NOW*. "I would not have been able to do this if I was still in the operating room, which proves that we can be effective in developing the next generation of physician leaders both inside and outside of the operating room."

Through her efforts, the next generation of physician leaders will look more like their patients. — *WE*

Nth Dimensions/AAOS Orthopaedic Summer Interns and members of the Diversity Advisory Board/Nth Dimensions Educational Solutions, Inc.

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