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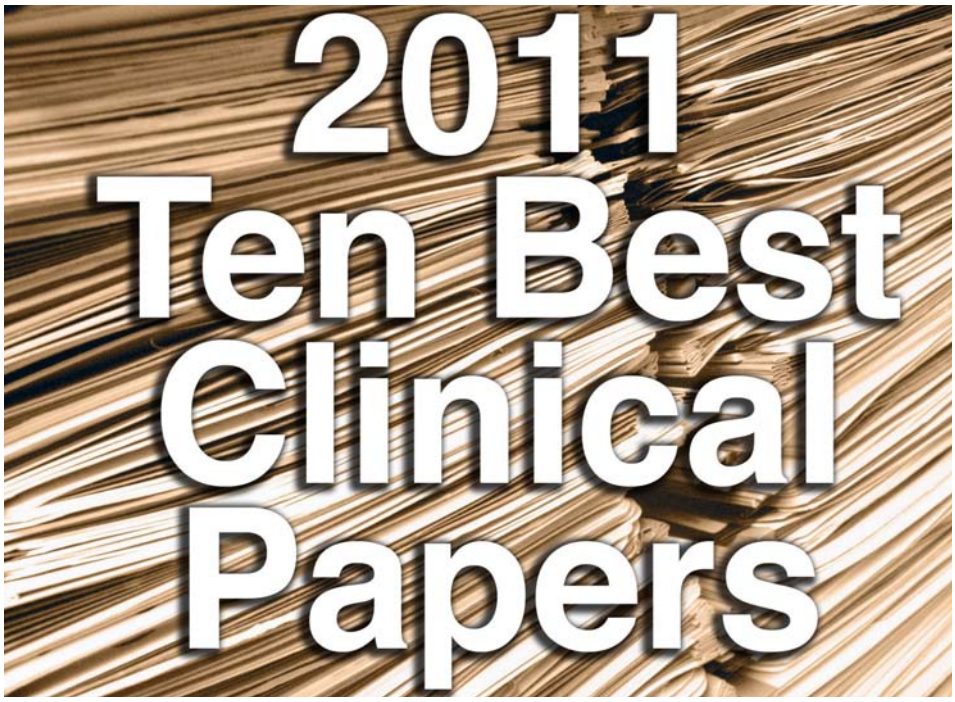
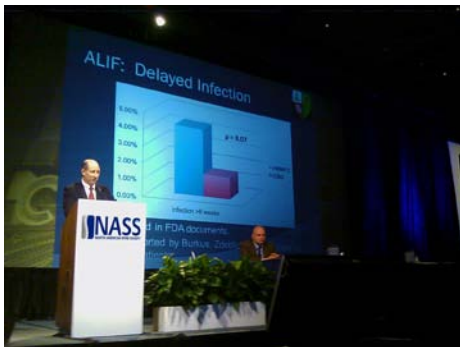
Orthopedics This Week

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: Greco-Roman politics used to be synonymous with culture, art, education and the modern concepts of law and liberty. Today Greco-Roman politics signify clownishly irresponsible economic policies by Berlusconi and Papadreou. Both are gone. We repeat our earlier forecast, a sustained rebound likely to start at year end.

Rank	Last Week	Company	TTM Op Margin	30-Day Price Change	Comment
1	1	Zimmer	27.75%	(2.42%)	Same day ZMH raises $550 million, management buys XtraFix System. The game right now is strategic expansion.
2	2	Medtronic	28.63	6.72	Unloved, underpriced but with a 29% operating margin. Looks good in the portfolio.
3	4	Orthofix	14.72	1.82	After last quarter's outstanding report, Vaters should send his analysts the following email: "How do you like them apples?"
4	3	Stryker	25.23	(1.36)	Aggressive acquisitions then large job cuts. Driving top AND bottom line growth but near-term disruptions.
5	7	Conmed	9.65	9.49	Buyers are looking at the details of last quarter's report and seeing a developing profit engine.
6	9	Exactech	7.69	2.47	13% increase in sales was better than most analysts expected for last quarter. Thank you knees and extremities.
7	6	Johnson & Johnson	26.33	1.43	On a valuation basis, JNJ is now among the more pricey orthopedic companies.
8	5	Kensey Nash	34.24	(5.97)	Has spent $54 million on R&D since 2009. Sales declined $11 million over that same period. Is the investment working?
9	8	Smith & Nephew	22.8	(2.26)	The most disappointing aspect of this past quarter's report is the shrinking margins. Wasn't management trying to raise them?
10	10	Integra	15.38	(17.36)	Way oversold. Way too cheap. When to buy? Timing is everything with IART.

Robin Young's Orthopedic Universe

Top Performers Last 30 Days

	Company	Symbol	Price	Mkt Cap	30-Day Chg
1	Bacterin Intl Holdings	BONE	$2.92	$116	35.81%
2	RTI Biologics Inc	RTIX	$4.49	$248	26.12%
3	Conmed	CNMD	$27.00	$754	9.49%
4	Medtronic	MDT	$35.10	$37,065	6.72%
5	CryoLife	CRY	$4.77	$134	3.92%
6	Exactech	EXAC	$15.37	$202	2.47%
7	Orthofix	OFIX	$34.71	$639	1.82%
8	Johnson & Johnson	JNJ	$65.25	178,188	1.43%
9	Synthes	SYST.VX	$166.30	$19,752	1.07%
10	TiGenix	TIG.BR	$0.99	$90	-0.46%

Worst Performers Last 30 Days

	Company	Symbol	Price	Mkt Cap	30-Day Chg
1	TranS1	TSON	$1.63	$44	-50.00%
2	Wright Medical	WMGI	$15.03	$591	-17.82%
3	Integra LifeSciences	IART	$31.36	$841	-17.34%
4	MAKO Surgical	MAKO	$32.85	$1,368	-15.92%
5	Tornier N.V.	TRNX	$17.94	$703	-13.33%
6	NuVasive	NUVA	$15.28	$645	-10.59%
7	Alphatec Holdings	ATEC	$2.00	$178	-9.09%
8	Symmetry Medical	SMA	$8.08	$293	-6.81%
9	Kensey Nash	KNSY	$25.36	$219	-5.97%
10	ArthroCare	ARTC	$28.28	$778	-4.78%

Lowest Price / Earnings Ratio (TTM)

	Company	Symbol	Price	Mkt Cap	P/E
1	Medtronic	MDT	$35.10	$37,065	10.67
2	Zimmer Holdings	ZMH	$52.50	$9,407	11.15
3	Integra LifeSciences	IART	$31.36	$841	12.96
4	Smith & Nephew	SNN	$44.62	$7,972	12.96
5	Johnson & Johnson	JNJ	$65.25	$178,188	13.32

Highest Price / Earnings Ratio (TTM)

	Company	Symbol	Price	Mkt Cap	P/E
1	Wright Medical	WMGI	$15.03	$591	31.98
2	RTI Biologics Inc	RTIX	$4.49	$248	28.06
3	NuVasive	NUVA	$15.28	$645	22.81
4	Synthes	SYST.VX	$166.30	$19,752	21.05
5	ArthroCare	ARTC	$28.28	$778	19.78

Lowest P/E to Growth Ratio (Earnings Estimates)

	Company	Symbol	Price	Mkt Cap	PEG
1	Orthofix	OFIX	$34.71	$639	0.82
2	RTI Biologics Inc	RTIX	$4.49	$248	0.99
3	Zimmer Holdings	ZMH	$52.50	$9,407	1.19
4	Stryker	SYK	$49.48	$18,935	1.28
5	Exactech	EXAC	$15.37	$202	1.39

Highest P/E to Growth Ratio (Earnings Estimates)

	Company	Symbol	Price	Mkt Cap	PEG
1	Kensey Nash	KNSY	$25.36	$219	3.00
2	Wright Medical	WMGI	$15.03	$591	2.66
3	NuVasive	NUVA	$15.28	$645	2.61
4	Johnson & Johnson	JNJ	$65.25	178,188	2.27
5	Symmetry Medical	SMA	$8.08	$293	2.09

Lowest Price to Sales Ratio (TTM)

	Company	Symbol	Price	Mkt Cap	PSR
1	Symmetry Medical	SMA	$8.08	$293	0.81
2	Alphatec Holdings	ATEC	$2.00	$178	1.04
3	Conmed	CNMD	$27.00	$754	1.06
4	Exactech	EXAC	$15.37	$202	1.06
5	Orthofix	OFIX	$34.71	$639	1.13

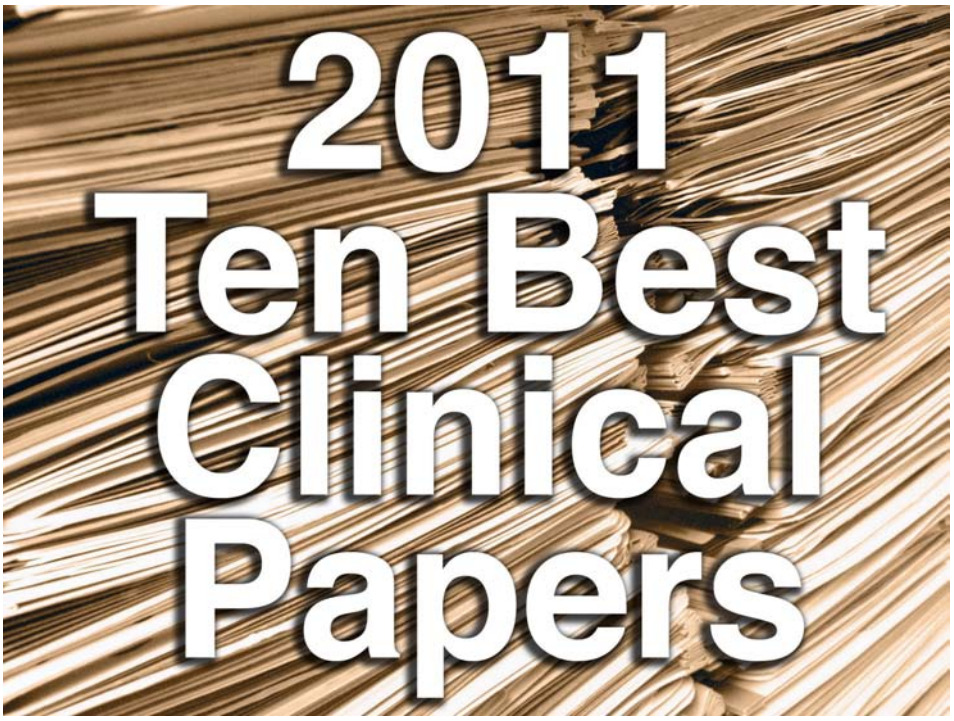
Highest Price to Sales Ratio (TTM)

	Company	Symbol	Price	Mkt Cap	PSR
1	TiGenix	TIG.BR	$0.99	$90	145.25
2	MAKO Surgical	MAKO	$32.85	$1,368	30.89
3	Synthes	SYST.VX	$166.30	$19,752	5.36
4	Bacterin Intl Holdings	BONE	$2.92	$116	5.04
5	Tornier N.V.	TRNX	$17.94	$703	3.09

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

Ten BEST Orthopedic Clinical Studies of 2011

By Robin Young



Morguefile and RRY Publications Photo Creation

Every year approximately 600,000 peer review articles from 5,560 journals are published in Medline and are included in index Medicus.

Somewhere in that mountain of paper are gems. So, to help pull a few out for our readers *OTW* asked *JBJS* (*Journal of Bone and Joint Surgery*) editor Vernon Tolo to send along his picks of the 10 best clinical papers of 2011. We also asked AAOS (American Academy of Orthopaedic Surgeons) staff members to poll the editors at several other journals for their picks and then we conducted our own review of the most cited clinical studies published in 2011 using Google Scholar to arrive at a collection of about 50 top ranked clinical studies for 2011.

From that list we selected the Ten Best Orthopedic Clinical Papers for 2011. What did we look for?

The Qualities of a Superior Clinical Paper

Enduring clinical papers start with a hypothesis that tackles practical and difficult clinical problems. From that beginning, successful authors design study frameworks that neatly isolate independent and dependent variables. These kinds of studies articulate each variable clearly and present them so that the reader can follow their progression through the course of the study.

When it works, light bulbs go off in the reader's mind.

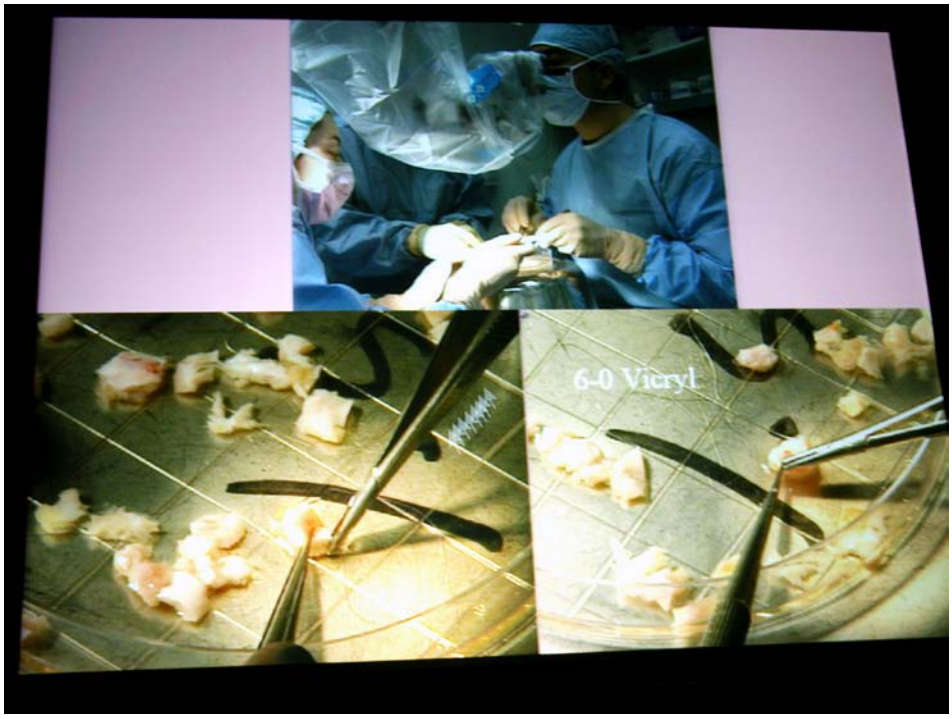
Next comes the peer review process. Journals like *JBJS or JAMA (Journal of American Medical Association) or Lancet* put manuscripts through a gauntlet of two to four clinicians, basic scientists, methodologists or other experts. Frequently, these peer reviewers are blinded to the authors in order to assure objectivity.

As we learned through our critical review of the June issue of *The Spine Journal* (*TSJ*), there is more to peer review than just improving or approving manuscripts. Peer review must examine the quality of the scientific method from which each paper derives its intellectual authority. Scientific method

establishes the connection between an idea or hypothesis and practical experience. And great papers use the scientific method to create clarity and unambiguous transparency.

Remember, clarity and transparency invites critical review and, yes, refutation through repeated re-examination by other researchers and, of course, actual clinical practice. Great clinical papers are designed to be purified and extended by mutual criticism and intellectual cooperation.

That's the theory. In practice, again as we saw with the June issue of *TSJ*, researchers and editors can, like many of us lay people; prove reluctant to discard their biases even when evidence has shown them to be inadequate or invalid.



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But, here is the good news; we found a group of outstanding clinical papers which meet these high standards. Here, then are our picks of the Ten Best Clinical Papers for 2011.

Ten Best Orthopedic Clinical Papers for 2011

Number 10:

Title: *The Initial Response of GFP Reporter Periosteal Cells to Bone Fracture*

Lead Author: Ushiku, C
Co-Authors: Rowe, D W; Jiang, X; Wang, L; Adams, D J

Discussion: As orthopedics moves into the era of advanced biologic and regenerative therapies, papers like this one lay the foundation for their safe and effective application in the clinical setting. Biologic therapies operate at the cellular level and this paper used a rat model to decode the spatial and temporal events that occur after bone fracture. The model used is a GFP reporter mouse which is designed to identify cells at increasing levels of differentiation within the osteoblast lineage.

In layperson's language, the GFP reporter model allows a researcher to observe the phenomenon of bone healing following fracture in slow motion. Led by University of Kyoto Professor Ushiku, the study authors evaluated the process of fracture healing at 1, 2, 4 and 6 days with 3 mice at each time point. This study, which won an award from ORS (Orthopsedic Research Society) , contributed significantly to the understanding of fracture repair, the reasons for non-unions and lays a foundation for testing current and future regenerative therapies

Publication: *Orthopedic Research Society* award winning paper

Number 9:

Title: *Is Surgery for Cervical Spondylotic Myelopathy Cost-effective? Results of a Prospective Study with Health Utilities Assessments*

Lead Author: Michael Fehlings, M.D., Ph.D., FRCSC
Co-Authors: Eric Massicotte, M.D., FRCSC, Branko Kopjar, M.D., Ph.D., Neilank K. Jha

Discussion: Making the case for the cost-effectiveness of spine surgery is a daily, patient by patient battle for every spine surgeon. This study tackles this very practical problem for cervical spondylotic myelophathy (CSM) surgery. To the best of the researchers' knowledge

this was the first study to analyze the cost effectiveness of this type of surgery and to find the cost-utility ratio for CSM surgery. This study earned high marks for its hypothesis, readability and clarity of its outcome measures. Further study will be required to further isolate and quantify such independent variables as comorbidities and life style factors.

Publication: North American Spine Society Value Abstract Award Winner

Number 8:

Title: *Computer-Assisted Techniques versus Conventional Guides for Component Alignment in Total Knee Arthroplasty: A Randomized Controlled Trial*

Lead Author: William G. Blakeney, MBBS
Co-Authors: Riaz J.K. Khan, MBBS, BSc(Hons), FRCS(Tr&Orth), FRACS; Simon J. Wall, MBBS, BSc(Hons), FRCS(Tr&Orth)

Discussion: Computer-assisted surgery in orthopedics is one of the fastest growing changes in the OR. The promise of such technologies is more precise alignment of components, more accurate cuts, burrs and tissue removal and, therefore, fewer complications, less OR time and better patient outcomes. This study earned high marks for stress testing this promise using a randomized controlled trial study design and isolating a clear and, presumably unambiguous independent variable – alignment accuracy. The study used three arms; one with the computer assistance and two with guides. Finally, with 107 patients in the study, the authors presented their conclusions with authority.

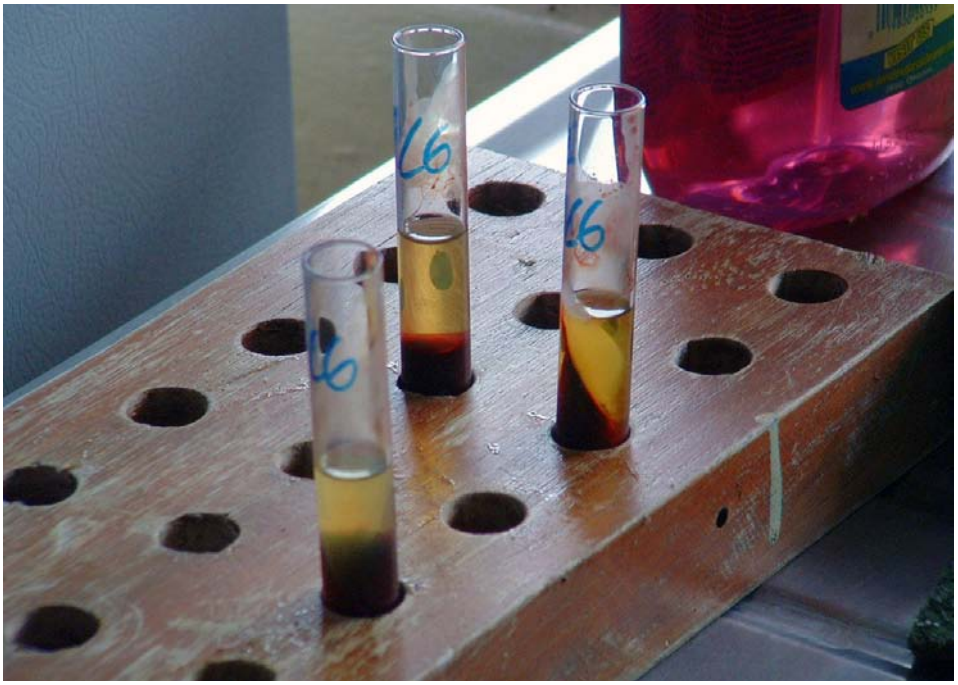
Publication: *J Bone Joint Surg Am.* 2011; 93(15):1377-1384 doi:10.2106/*JBJS*.I.01321

Number 7:

Title: *The Effect of Regional Hip Capsule Defects on Total Hip Dislocation Stability – A Finite Element Analysis*

Lead Author: Elkins, J M
Co-Authors: Stroud, N J; Pedersen, D R; Tochigi, Y; Rudert, M J; Ellis, B J; Callaghan, J; Weiss, J A; Brown, T D

Discussion: We admit to a bias toward finite element analysis since it can handle complicated systems like articulating joints or, for that matter, weather systems and auto crashes, and still deliver excellent predictive accuracy in a model format. That, in turn helps surgeons to visualize, understand and confidently treat complex systems like hip articulation and dislocation. Instability and dislocation is a frequent complication of THA (total hip arthroplasty) and this study put forth a clear and unambiguous hypothesis that hip capsule defects are one of its primary causes. It's hard to go wrong with a solid hypothesis, cadaver models and a well designed finite element analysis. The authors powered up their study with 109 individual cadaveric capsules. Not only did the authors confirm that cap-



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sule defects contribute to hip instability but they also provided details. On the downside, this was a fairly densely written study, but still worth the effort.

Publication: Orthopaedic Research Society award winning paper

Number 6:

Title: *A Prospective Randomized Controlled Trial Comparing Occupational Therapy with Independent Exercises after Volar Plate Fixation of a Fracture of the Distal Part of the Radius*

Lead Author: J. Sebastiaan Souer, M.D.
Co-Authors: Geert Buijze, M.D.; David Ring, M.D., Ph.D.

Discussion: We were most impressed with the sheer practicality of the hypothesis supporting this study. The authors also earned high marks for a clear scoring method and readability. Specifically, the authors tested the effect of formal occupational therapy after open reduction and volar plate fixation of a fracture of the distal part of the radius. Their hypothesis was that there was no difference between patients who'd received formal occupational therapy and those who'd been instructed for independent exercises. This study powered up with 94 patients and reported that there was a difference and that it favored patients with prescribed independent exercises! No doubt this study will be repeated by other researchers and we look forward to seeing if life style factors like smoking, obesity, etc. affect the outcomes.

Publication: *J Bone Joint Surg Am.* 2011; 93(19):1761-1766 doi:10.2106/*JBJS*.J.01452

Number 5:

Title: *Total Ankle Replacement in Obese Patients: Functional Outcome, Weight Change, and Component Stability in 118 Consecutive Patients*

Lead Author: Alexej Barg, M.D.
Co-Authors: Markus Knupp, M.D.; Andrew E. Anderson, Ph.D.; Beat Hintermann, M.D.

Discussion: The obesity epidemic in the U.S., Europe and increasingly in Asia has been linked to poor outcomes from orthopedic surgery. To what extent does obesity affect orthopedic clinical outcomes? This study tests this hypothesis in the case of total ankle replacement surgery. The paper reviewed 118 patients who'd undergone 123 total ankle replacement surgeries over an 8-year span. The authors did an excellent job of documenting not only the specific post operative complications like DVT (deep vein thrombosis) or medial malleolar fractures, they also tracked changes in weight by age and gender and topped it off with an all encompassing VAS score.

Publication: IFFAS (International Federation of Foot & Ankle Societies)

Number 4:

Title: *Impaired Growth of Denervated Muscle Contributes to Contracture Formation Following Neonatal Brachial Plexus Injury*

Lead Author: Sia Nikolaou, Ph.D.
Co-Authors: Elizabeth Peterson, BS; Annie Kim; Christopher Wylie, Ph.D.; Roger Cornwall, M.D.

Discussion: What attracted us to this study was its novel hypothesis—that reduced growth of denervated (lacking nerve supply) muscles contributes to shoulder and elbow contractures following neonatal brachial plexus injury. We gave the authors high marks for developing a mouse model to test the

hypothesis and, of course, control variables. As a result, the authors were able to articulate a new pathway for future researchers to investigate rational contracture prevention and treatments. The study was well written and we were able to easily follow the logical progression of its findings.

Publication: *J Bone Joint Surg Am*. 2011; 93(5):461-470 doi:10.2106/*JBJS*.J.00943

Number 3:

Title: *Load Response of the Tarsal Bones in patients with Flatfoot Deformity: In vivo 3D study*

Lead Author: Masamitsu Kido, M.D.
Co-Authors: Kazuya Ikoma, M.D., Ph.D.; Kan Imai, M.D., Ph.D.; Masahiro Maki, M.D., Ph.D.; Ryota Takatori, M.D., Ph.D.; Daisaku Tokunaga, M.D., Ph.D.; Nozomu Inoue, M.D., Ph.D.; Toshikazu Kubo, M.D., Ph.D.

Discussion: Will documenting bone rotation of each foot joint improve treatment plans for flat foot? That's the question these authors explored in this particularly well designed and executed study. The authors are this year's Roger A. Mann award winners from AOFAS (Association of Foot and Ankle Surgeos). This study simply measured bone rotation differences in each joint in the hindfoot and compared the load responses between normal and flat feet. What elevated this study even further was its use of 3D to measure the load response dynamics of the foot. The authors measured 21 patients with normal feet and 21patients with flat foot deformity. Their results clearly documented that foot joint instability occurred in the rear foot with load in patients with flatfoot deformities.

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Publication: AOFAS (Association of Foot and Ankle Surgeons)

Number 2:

Title: *Diagnosis of Early Postoperative TKA Infection Using Synovial Fluid Analysis*

Lead Author: Hany Bedair
Co-Authors: Nicholas Ting, Christina Jacovides, Arjun Saxena, Mario Moric, Javad Parvizi and Craig J. Della Valle

Discussion: Post operative infections are bad news for patient and surgeon alike. While incidence rates are declining due to better OR facilities and stricter asceptic measures, the risk of infection remains one of the most troubling surgical complications. Detecting it early is one key to minimizing its impact. This study tests the hypothesis that synovial fluid can provide early evidence of infection following TKA. The authors powered up this study with 11,964 primary TKAs and looked at 146 that had knee aspiration within 6 weeks of surgery. Infection was diagnosed in 19 of the 146 knees using positive cultures or gross purulence. The authors took care to gather demographic information,

time from surgery and a variety of other test data. The study data confirmed the author's hypothesis. White blood cell counts in synovial fluid can accurately predict infection.

Publication: *Clinical Orthopaedics and Related Research* Volume 469, Number 1, 34-40, DOI: 10.1007/s11999-010-1433-2

Number 1:

Title: *Parathyroid Hormone 1-84 Accelerates Fracture-Healing in Pubic Bones of Elderly Osteoporotic Women*

Lead Author: Peter Priechl, M.D.
Co-Authors: Lukas A. Holzer, M.D.; Richard Maier, M.D.; Gerold Holzer, M.D.

Discussion: The authors of this study posited a hypothesis that tackles three of the most important issues confronting surgeons today—osteoporotic bone fractures, use of trophic therapeutics in surgery and hip area fractures. Even the most casual reader is familiar with the morbidities associated with hip area fractures. Authors Priechl, Holzer L, Maier and Holzer G., effectively designed one study to knock down three questions. The design started with a focus on bone absorption scale and computed tomography—which should render irrelevant several extraneous variables like age, gender, diabetes and so forth. It focused the study clearly on compromised bone quality—regardless of the cause. But then it assembled a solid group of tests including VAS (Visual Analog Scale), timed "up and go" tests to compliment computed tomography to measure each patient's response to PH 1-84. The authors careful description of the treatment protocols generated clear differences between the treatment and control groups earnings them high marks and, of course, recognition as one of the ten best clinical papers of 2011 from both *JBJS* and *OTW*.

Sixty-five patients were in the study. Twenty-one received once-daily injections of PTH 1-84. Time to fracture healing was 7.8 weeks in the treated group versus 12.6 weeks in the control group.

Publication: *J Bone Joint Surg Am.* 2011; 93(17):1583-1587 doi:10.2106/*JBJS*.J.01379

In conclusion, congratulations to the authors who contributed so much, so well to the advancement of orthopedic care in 2011 and also to the editors of the journals who worked with these authors to create papers with true intellectual authority. ◆

NASS 2011: Controversies in Chicago

By Walter Eisner

"Who are we to believe?" asked the surgeon from the audience during a well attended session called "Controversies In Spine" at the 26th Annual Meeting of the North American Spine Society (NASS) held in Chicago the first week of November.

The question was put to Eugene Carragee, M.D., the editor-in-chief (EIC) of *The Spine Journal* (*TSJ*) whose controversial June 2011 issue about BMP researchers hovered over the meeting like an elephant in the room. The controversy centered on allegations that some researchers were biased because of payments from industry.

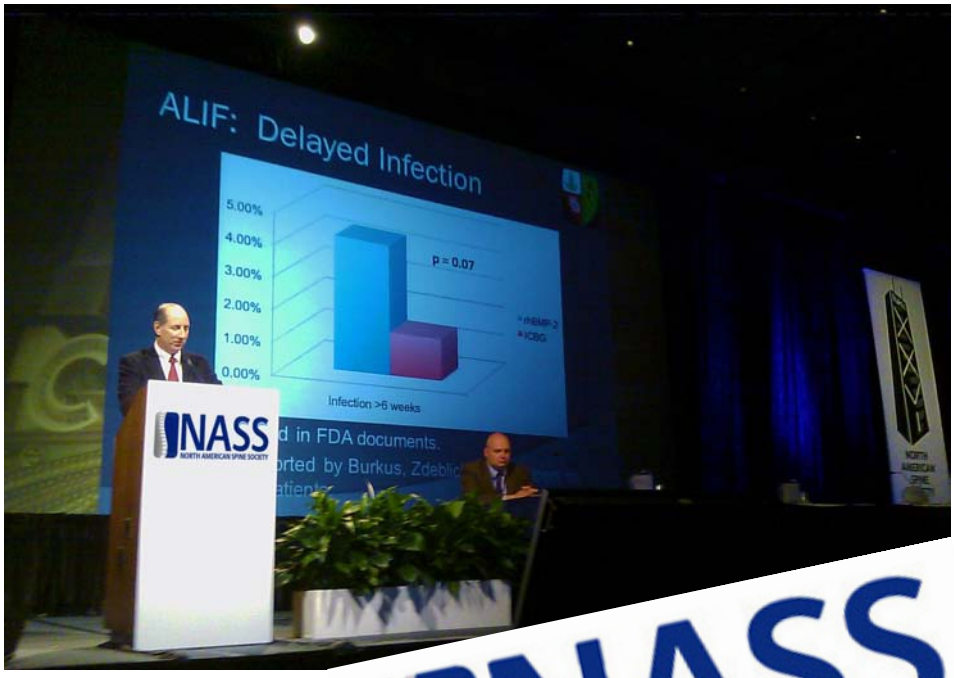
"I'm 10 years into my practice. Who do we believe? When the literature comes out, what's real and what's not?"

Carragee said there are process changes in place so that the disclosures are clearer, the associations are clearer. "I think 15 years ago in publishing it would be impossible to connect the primary data to an article. Now you can.... There are plenty of reasons to think that there can be a better review."

"On the other hand, if someone says I have a really really powerful growth factor and I gave it to 800 people and I didn't have a single or adverse reaction that is ascribed to this powerful growth factor—then, I think your mother would tell you what to believe there."

Research, Corruption and Bias

Jerry Knirk, M.D., from the Boston area told Carragee from the audience, "Your paper regarding BMP really brings up the fact that we need a better way to fund research. And it's an interesting thing to note that not only politicians are corruptible by large amounts of money. We need a way to fund research that's not depended on industry and massive amounts of payments to individuals for data."



Carragee told Knirk that there was a whole literature on incentives and the acknowledged biases and apparent biases.

"But certainly if you line all these things up where you have the sponsor and the investigator who has products with the same sponsor also writing the paper on the products, they have a financial relationship with the same sponsor, you're compounding the risk of intentional or unintentional bias all the way along the way."

"In the [June] editorial we've said this is a problem that is as old as the Scriptures and as clear as the U.S. Constitution. This is not new business. I don't think that we should have an exceptional idea of ourselves that in the early 21st Century these motivations that are found in the Old Testament have suddenly disappeared," added Carragee.

With that exchange and the ensuing reports in *The New York Times, Reuters* and other media about the controver-

sies surrounding BMP research, it was tempting to see the NASS meeting as being about Carragee and *TSJ*.

Przybylski Tackles Controversy

The outgoing NASS President, Greg Przybylski, M.D., fed into that narrative by devoting a portion of his annual presidential address to the controversies surrounding *TSJ*. The annual addresses are touchstones about the state of spine care and providers.

Przybylski told attendees that there had been "a lot of controversy raised lately despite the fantastic accomplishments of *TSJ*, including becoming the leading spine journal in the U.S. Many focused on the June issue on BMPs with lots of questions and concerns being raised."

Elsevier Primary Decision Maker

"*TSJ* is in fact, the journal of NASS. It is owned by Elsevier who is the publisher. While we work collaboratively, Elsevier is the primary decision maker in terms of choosing the editor-in-chief. There is a separation between *TSJ* and the *TSJ* Editorial Board and the NASS Board and association in order to maintain scientific integrity.

"This is no different than other professional medical associations in which the journal has an arms-length relationship. The Association does not, and should not have any activities that could be politically motivated that influence the editorial process."

Przybylski said the editorial process is guided by rules of its own and Elsevier ensures that those rules are followed.

Five Trends in Spine

Przybylski's speech however, focused primarily on the socio-economic issues confronting the spine care community. He noted numerous problems with the Affordable Care Act and spoke about five trends that he believes will impact providers.

Limitation. In the past there were few limitations as choices made by physicians and patients were approved routinely. But with more spine procedures being performed, Przybylski said insurers began to look at coverage and "misplaced financial incentives."

Innovation. Most clinical studies used to be done in the U.S. and venture capital was readily available. But now, he said trials are moving to Europe with less than half of all trials done in the U.S. in 2009 and venture capital availability has declined. He also noted a 2.3% excise tax on device manufacturers that will result in job losses and reduced investments by industry.

Regulation. Documentation to get paid used to be less complicated, said Przybylski. But continuing medical education and recertification requirements, quality reporting, electronic mandates, more data collection and lessened industry financial support for continuing education is making it harder on physicians to comply with regulations.

Compensation. Przybylski said providers will be challenged as the fee-for-service system is phased out. He also pointed to a 30% cut in physician payments scheduled for 2012, the IPAB, primary care flexing its muscles at the RUC (Relative Value Scale Update Committee) and bundled payments will all make it hard for physicians to get paid.

Incarceration. "But, what I'm most fearful of is incarceration," said Przybylski. He noted that in the past, government investigations have focused on institutional audits with settlements over fraud involving billing practices and fraudulent billing by durable medical equipment services.

But that's changing, according Przybylski, as congressional investigations and recovery audits are now focusing on physicians. "The DOJ will look at individual practitioners for criminal investigations." He

cited the possible kickback problems with physician-owned distributorships and Medicaid criminal indictments by state Attorneys General.

"The future seems sobering," said Przybylski.

The Face of NASS?

Given these external pressures on NASS members and recent efforts to convince payers and regulators that the association is the professional society "to believe" when it comes to providing unbiased scientific evidence for quality spine care, we wondered if the high profile of Carragee and *TSJ* was pitting members against one another and making Carragee the face of the society?

We asked Dr. Carragee and some former presidents and a former editor-in chief of the journal that question.

Guyer: "A Sign of the Times"

Rick Guyer, M.D., 2008 NASS president, told us he believes the controversy is important to a small proportion of the society's membership and it would be mistake to say that the issue was the focus of the NASS meeting or the organization. He told us what was happening is a sign of the times, not just in medicine, but in all areas. He reminded us that NASS continues to grow; now having 6,800 members. He believes the changes to strengthen transparency and disclosures are a good thing.

Rick Guyer, M.D.

He told us that the way Dr. Carragee and *TSJ* went about the BMP articles can be debated, but the principles are sound.

Baker: "Controversy Detracts From Urgent Problem"

Ray Baker, M.D., NASS president before Przybylski told us that to say the face of NASS in 2012 looks like Gene Carragee is more "conspiratorial than the reality."

Ray Baker, M.D.

He told us the controversy is unrelated to NASS in the larger sense. He said Carragee was not asked to be EIC of *TSJ* as a part of the new "ethical NASS." He was nominated by Charlie Branch, M.D., received the approval of the board, and was then formally accepted by Elsevier as EIC because of his qualifications. Period.

Baker said NASS honestly seeks diversity, including seeking out some board members with a strong track record of industry relations. "You only have to look as far as Charlie [Branch] and my choices for program chairs (who sat as board observers): Steve Glassman, M.D. and Alex Vaccaro, M.D. Thus, mixing the two topics is really a stretch and, I believe, incorrectly portrays the inner workings of NASS and the relationship between NASS and *TSJ*."

In retrospect however, Baker says NASS could have done some things better, including accurately portraying *TSJ* as separate from NASS. Nevertheless, he said the association had upheld the sacred firewall between a professional medical association and journal/editorial content. "We did not use TSJ as a bully pulpit for NASS' views."

Baker believes that all detracts from a far more urgent problem: how to maintain the U.S. as #1 in medical device innovation over the next decade?

"We need to spend less time 'circling the wagons and shooting inward'; we need to work together to improve the FDA; work on coding, coverage, and reimbursement to facilitate adoption of appropriate new technologies; and work with industry to produce revolutionary innovations that improve quality at a low cost. To accomplish this, we all need to work together. This includes associations and industry, as well as physicians and industry. These relationships are not only appropriate, they are vital to the future of spine care."

"That is why the NASS AM in Chicago was really more about our new registry and our value awards, and less about *TSJ*/BMP.

Branch: "Accused and Accusers Lining Up For Battle"

Charlie Branch, M.D., the previous editor of *TSJ* who nominated Carragee for the post told us the 2011 NASS meeting was by many metrics a great success.

Charlie Branch, M.D.

"Yet, the focus on Gene Carragee's analysis and commentary on the BMP studies generated a great sense of disappointment. Given that much of his presentation had already been published, this wasn't really new information but should have been a very meaningful platform for honest, scientific debate of the merits and flaws of the original studies and Carragee's retrospective analysis."

But, says Branch, given the highly charged presentation of the June issue of *TSJ* and the NASS press releases "fanning the fire, this scientific meeting became more of a media or professional society circus. If this entire subject had been presented in the journal and by the NASS Media team with a humility or lack of hubris that Gene Carragee appeared to embrace with his platform presentations, then a true scientific debate and credible search for meaning and truth might have ensued."

"Instead, the potential for this has been lost forever in the polarity of the accused and the accusers lining up to do battle."

Finally, we asked Dr. Carragee about the controversy.

Carragee: "Problem of Systematic Bias"

Carragee said he is only an "ex officio" NASS board member.

"I serve as the editor in chief of *TSJ*. NASS, like most organizations with 'sister' publications, adheres to a policy of independence for the journal's editorial board. The editorial board in turn follows the guidelines of the International Committee of Medical Journal Editors, the Committee on Publication Ethics and other editorial best practices. In my opinion, *The Spine Journal* and NASS enjoy a mutually beneficial relationship, largely in part because of that very independence."

Carragee says that the journal shares with NASS the mission of improving quality clinical care. The journal's mandate is to do so through the scientific presentation of evidence, with the debate and dialog of a scientific journal; NASS has a much broader platform to effect that end. "I would disagree that we are moving away from that point of reference."

"For medicine as a whole, the last decade or more has brought into focus the problem of systematic biases associated with large economic forces and potential conflict of interests. From

Nature, to Lancet, to NEJM and JAMA, these have become important and high-priority issues to address in the field of scientific publication—it's not a matter of "outing" researchers with conflicts, as you put it, but giving the reader the context to judge potential research bias. Addressing potential research bias, be it in study design, data collection, analysis or presentation, is the primary operational function of an editorial board. It should not, in my opinion, be controversial when an editor works to that end."

Luther, Hemingway, Kennedy and Euripides

We asked him about his biblical references and whether or not he sees NASS undergoing a Reformation where he is the Martin Luther.

Regarding biblical references, Carragee wasn't so sure. "In the June BMP-2 editorial we cited Hemingway and John Kennedy; in the vertebroplasty editorial it was Arthur Conan Doyle and Shakespeare; in my BMP-2/cancer symposium presentation it was Euripides. Although afflicted at a young age with a classical Jesuit education, I haven't found it an adult disability. Martin Luther was a radical, innovative theologian—none of our proposals regarding editorial process reforms are particularly new. If people are shocked, it's more along the lines of Claude Raines in 'Casablanca'—who was 'shocked, shocked' to discover gambling going on at Rick's American Cafe."

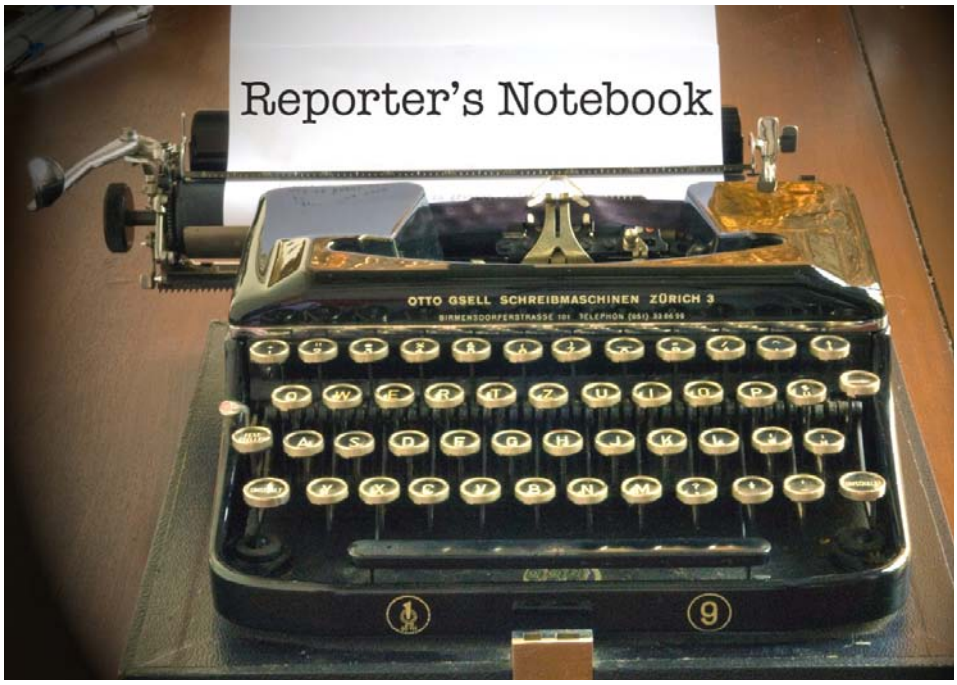
Where NASS stands today in its relationship with *TSJ* and whether the BMP controversy is symptomatic of a deeper schism between various member groups within the organization itself will play out over the term on the new NASS president elected in Chicago, Michael Heggeness, M.D., Ph.D. of Baylor University. ◆

Reporter's Notebook

By Elizabeth Hofheinz

Dear *OTW* Reader:

NASS and The Spine Journal…could perception management have been better? Johns Hopkins awards musculoskeletal research grants…international trauma care and research event a roaring success…those wanting to dump industry funding living in a fantasy world?



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Research From Rush Brian Cole, M.D., Professor in the Departments of Orthopaedic Surgery and Anatomy & Cell Biology at Rush University Medical Center, tells *OTW*, "We have a number of exciting biologics that we are working on in test tubes and animal models. For example, we are looking at platelet rich plasma (PRP), and our early clinical results show possible benefits for osteoarthritis (OA) and tendinopathy. Now, we have the burden to prove this in a clinical setting…what's really needed are ***well powered*** randomized clinical trials. We are also undertaking a trial on OA in the knee, and will soon move forward with one in the shoulder—in both of these we are comparing PRP to traditional treatment models."

OrthoHelix Has Award-Winning CFO Cameron Rubino of OrthoHelix Surgical Designs, Inc. was recently awarded the Crain's Cleveland 2011 CFO of the Year Award in the medium private company category. OrthoHelix indicates that Rubino has been instrumental in many aspects of the business, including the fundraising process and management of all aspects of financial reporting. By writing two Third Frontier grant applications, Rubino has helped OrthoHelix secure $2 million to complete the development of new technology and add more than 60 jobs over three years. Rubino was previously the CFO of a $170 million venture capital firm and spent a number of years as an auditor with a Big 4 public accounting firm. Rubino has also worked with a number of start-up companies providing financial advice prior to joining OrthoHelix.

Industry Not Out to Get People A spine guru tells *OTW*, "While there is a lot of concern in spine about industry funded research, what people often forget is that companies don't want to harm people…and they certainly don't want to invest millions of dollars and then have everything blow up in their faces. Industry is a very important partner for orthopedic surgeons, and it is a mistake to assume that any industry funded research is tainted. The fact is that as a field we ***are*** getting better at reporting conflicts of interest. *And anyone who thinks that there is enough funding to do large research trials without industry is living in some fantasy world.*"

NASS Awards! Hong Joo Moon, M.D., Ph.D. of Seoul, South Korea has been awarded the 2011 Research Traveling Fellowship. Winners of the 2011 Research Grant award are: D. Greg Anderson, M.D., of Philadelphia, Pennsylvania (Correlation of Clinical Outcome after Lumbar Fusion with Intradiscal Cytokine Expression and a Novel Assay System [Translational]); Jeffrey Borckardt, Ph.D. of Charleston, South Carolina (Transcranial Direct Current Stimulation [tDCS] in the Management of Acute Post-Spine Surgery Pain: A Prospective Randomized Controlled

Trial [Clinical]; Fackson Mwale, Ph.D. of Montreal, Canada (Biological Repair of Intervertebral Disc Degeneration [Basic]); Claudio Hetz, Ph.D. of Santiago, Chile (Defining the Role of the Endoplasmic Reticulum Stress and the UPR in Spinal Cord Injury [Basic]).

Disc Herniation: New Aproaches James Iatridis, Ph.D., is Professor and Director of Spine Research at the Mount Sinai School of Medicine in New York City. He tells *OTW*, "There are few procedures available for treating intervertebral disc herniation that address structural repair of the ruptured annulus fibrosus; consequently, when surgical microdiscectomy is performed to address acute pain there is a high risk of chronic disc degeneration—which can lead to future back pain. There is little that surgeons can do at the time of the microdiscectomy to slow the progression of disc degeneration or reduce the pain...we think that early and minimally invasive interventions are key. We are working on two strategies: one using biological therapies and the other using annulus repair. We recently developed a new biomaterial to enhance annulus repair following herniation. Our biomaterial uses a crosslinking agent to modify fibrin. Thus far we have found that this modified fibrin: has material properties closely matching those of the native annulus tissue, greatly increases the adhesive strength to native tissue, is cytocompatibile and slows the resorption rate of fibrin, allowing it to last significantly longer. In the next few months we will be making additional modifications to improve cytocompatibility and enhance cell proliferation. Our material is best used as a sealant for small defects or as an adhesive to be used with other biomaterials. I believe that there are several promising tissue engineered biomaterials that may eventually be used separately or in combination to provide effective annular closure following herniation."

Johns Hopkins Awards Grants The Johns Hopkins Center for Musculoskeletal Research has established a Musculoskeletal Research Pilot and Feasibility Grant Program. The goals of this program are to raise the visibility of the musculoskeletal research community and to support young investigators in the field. The awardees for 2011 are: Ron Cohn, M.D., Assistant Professor, Pediatrics, McKusick-Nathans Institute of Genetic Medicine (Preclinical testing of TGF beta inhibitors in models of acquired myopathies); Tao Qiu, Ph.D.; Assistant Professor, Orthopaedic Surgery (Role of TbetaRII in coordination of PTH and TGF beta in bone remodeling); Ryan Riddle, Ph.D., Assistant Professor, Orthopaedic Surgery (Interaction of Hif-1 and Beta-catenin during skeletal mechanotransduction).

NASS and *TSJ*: Perception Management Someone familiar with the workings of NASS tells *OTW*, "The subtext of the 2011 NASS meeting was *The Spine Journal*/BMP issue. There is enormous potential for BMP-2. Doctors are wondering where the truth lies in terms of how best to use BMP...and they are asking, 'Where is the real scientific data?' Many are afraid of litigation. There is a pervasive misperception that there is a connection between *The Spine Journal* [TSJ] activities and the NASS Board. *TSJ* actions are independent of NASS Board influence, but in retrospect, NASS could have done some things differently that would have helped people understand the separation between

what the journal does and what NASS does as an organization. Perhaps separating our press releases from those of *The Spine Journal* would have helped. The organization can do more to manage these perceptions...but in the end, there are always people who love conspiracy theories."

Volunteer Recognized Dr. Jacob Heydemann, an El Paso orthopedic surgeon, has been recognized as a "Border Hero" by the Las Americas Immigrant Advocacy Center. Dr. Heydemann, who regularly donates his time and services to clinics and hospitals in Mexico, was honored with the award at a dinner on November 5, 2011.

UConn Welcomes New Orthopedists Two new orthopedic surgeons have joined the University of Connecticut Health Center…**Dr. Tessa Balach** is among a small group of orthopedic surgeons in the U.S. with specialized training in the management of musculoskeletal tumors, both adult and pediatric. She also has expertise in the treatment of patients with arthritis of the hip and knee. Dr. Balach completed her orthopedic oncology fellowship at the University of Chicago Medical Center, where she also completed her orthopedic surgery residency. Her medical degree is from New York Medical College. **Dr. Isaac Moss**, specializes in advanced surgical management strategies for a range of acute spine problems as well as minimally invasive surgical techniques. Dr. Moss completed his fellowship training in spinal and scoliosis surgery at Rush University Medical Center in Chicago; he completed his orthopedic surgery residency at the University of Toronto, and earned his medical degree at McGill University in Montreal.

North, South America Cooperate for Trauma Care Ted Miclau, M.D., an orthopedic surgeon with San Francisco General Hospital, recently chaired the

Forum of the Americas. Dr. Miclau tells *OTW*, "I was asked to Chair a meeting sponsored by the Osteosynthesis and Trauma Care Foundation, and I looked forward to bringing surgeons together from Canada, the United States, and Latin America in a way that I was not aware had been done before. There were surgeons representing every country in South America as well as Mexico, Costa Rica, and Nicaragua; surgeons from China, Japan, and Europe were also in attendance. The topics of the meeting included trauma systems, the conduct of clinical research, and current topics in orthopedic traumatology. We also wanted to take this opportunity to build a potential research consortium for Latin America, and we held a breakout session that identified obstacles to research. Going forward, the University of California, San Francisco/San Francisco General Hospital Orthopaedic Trauma Institute and the Institute for Global Orthopaedics and Traumatology will work with Mohit Bhandari, M.D. and McMaster University on bringing this group together with larger global groups in Asia and Africa. One of the likely early research topics will be to develop fracture registries worldwide. We will also work together on developing funding strategies for this worthwhile endeavor involving the developing world."

Resurgens Orthopaedics Growing

Georgia's largest orthopedic practice has opened its doors to Dr. Jeffrey I. Peretz, an orthopedic surgeon specializing in total joint replacement and hip and knee arthroscopy. Dr. Peretz completed his medical degree at the University of Medicine and Dentistry of New Jersey at the New Jersey Medical School. He completed his residency in orthopedic surgery at the Drexel University College of Medicine in Philadelphia, Philadelphia, and completed an Otto E. Aufranc Fellowship in Adult Reconstructive Surgery at New England Baptist Hospital in Boston, Massachusetts. ◆

company

LDR and Centinel Spine Correct Oblique Cage Claims

We ran a story on November 2 about the FDA clearance of LDR's ROI-A Oblique ALIF Cage.

The company said the clearance made LDR the first company to introduce such a device into the U.S. market.

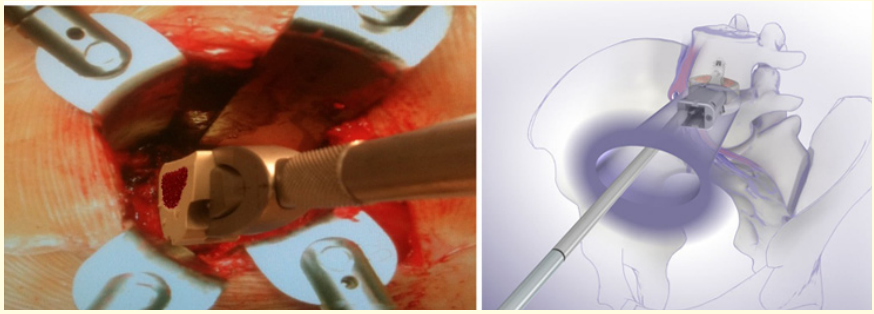
However, a few days later, John Viscogliosi, the chairman and CEO of Centinel Spine, Inc. wrote to tell us that his company's STALIF Oblique Cage has been sold in the U.S. for five years. In early 2008, Raymedica, LLC merged with UK-based Surgicraft to form Centinel. The device was previously marketed by Surgicraft.

We checked back with LDR about Viscogliosi's catch.

Here's what they had to say:

"We were unfortunately unaware of the Centinel device as we prepared the release for the ROI-A Oblique ALIF cage. That said, LDR is encouraged to learn that other manufacturers have also recognized the unmet clinical need that can be addressed by an oblique approach to the anterior lumbar spine."

—WE (November 11, 2011)



STALIF Oblique Cage/Centinel Spine, Inc. ROI-A Oblique Cage/LDR

Stryker Cutting Around 1,000 Jobs

Citing the upcoming 2.3% medical device tax as well as a desire to drive continued growth, Stryker Corporation says it's going to cut approximately 1,000 jobs by the end of 2013 to reduce costs by over $100 million beginning in 2012.

A November 10 announcement said the company was going to cut its global workforce by approximately 5% by the end of 2012. The company employs over 20,000 workers worldwide, so the cuts should be approximately 1,000 jobs. The company said it will also implement other restructuring activities that are anticipated to reduce annual pre-tax operating costs by over $100 million. The cost savings add up to about $100,000 per job cut. Since the company doesn't pay an average of $100,000 per job, many of the savings will come from other cuts.

"As our markets continue to evolve, these actions are part of our ongoing focus on quality, innovation and cost, and position the company to continue to provide strong, consistent growth in a changing environment," said Stephen P. MacMillan, chairman, president and CEO. "Against this backdrop, we are committed to achieving consistent double-digit per share earnings growth in 2011 and beyond."

The company's statement said the job cuts and other restructuring activities are being initiated "to provide efficiencies and realign resources in advance of the new Medical Device Excise Tax scheduled to begin in 2013, as well as to allow for continued investment in strategic areas and drive growth despite the ongoing challenging economic

Morguefile and RRY Publications Photo Creation

environment and market slowdown in elective procedures. The reductions and restructuring activities are expected to be substantially complete by the end of 2012. Stryker will provide employees affected by these reductions with severance packages, counseling and job placement services."

The company expects to record pre-tax restructuring charges related to these reductions and restructuring activities totaling approximately $150 million to $175 million, of which approximately $85 million to $95 million are expected to be recorded in the fourth quarter of 2011.

No specifics were given of where the jobs cuts would take place.

—WE (November 11, 2011)

Tornier's Shoulders Lead 3Q Climb TABLE

Tornier N.V., focusing on the orthopedic extremity market, reported a 15.8% increase in revenue for the third quarter. Total sales reached $57.6 million.

That, according to Wells Fargo analyst Larry Biegelsen, makes Tornier a top performer in the fastest growing market in orthopedics.

Company President and CEO Doug Kohrs commented in a November 8 press release, "Led by upper extremity product lines, and despite economic and healthcare utilization headwinds, Tornier recorded another quarter of solid double-digit sales growth both as reported and in constant currency. Growth in our international markets was particularly strong, while our U.S. market performance was below our expectations in our lower extremity and sports medicine and biologics product lines. However, we remain confident that our ongoing instrument set investments and new product launches are positioning us for continued double-digit extremities growth."

The company reported that sales were led by the new Aequalis Ascend shoulder arthroplasty system, the continued adoption of the Aequalis reverse shoulder arthroplasty system and the CortiLoc glenoid. Further contributions came from the launch of the Simpliciti stemless shoulder system in select European markets and the Latitude total elbow prosthesis.

At the end of the third quarter, Tornier initiated an expansion of instrument sets to support recently launched lower extremity products such as the Stabilis ankle fusion system. Also in the third quarter, Tornier initiated clinical use of several new sports medicine and biologics products including the Insite FT PEEK anchors, its shoulder instability system and the Accel-PRP system. The company said its large joints and other product category, which includes hips and knees sold in select international markets, continued its constant currency growth at above market rates in the third quarter at 6.7% over the same quarter last year.

Tornier N.V. 3Q11	Sales ($ in millions)	% Change
Total Reported Sales	**$57.5**	**15.8%**
Upper Extremities	$37.7	17.8%
Large Joints	$10.6	17.9%
Lower Extremities	$5.9	6.9%
Sports Med/Biologics	$3.3	5.0%
Sports Medicine	$25.6	8.0%

Source: Tornier N.V.

Updated Guidance

The company updated its previous guidance and now projects 2011 sales in the range of $257.5 million to $260 million, representing global growth of 13% to 14% as reported, and

TORNIER

Aqualis Shoulder/Tornier N.V.

10% to 11% in constant currency over 2010 sales. Full year total extremities product sales are expected to grow 14% to 15% as reported or 12% to 13% in constant currency.

Tornier and the Market

Biegelsen noted that revenue in the quarter was below management's previous guidance. "While we are disappointed with the slight miss in the quarter, the performance was not unexpected given the mixed quarterly results of some other extremities companies."

Biegelsen pointed out that Tornier outperformed the extremities market and "still represents a top-tier medtech growth rate in our view. By our estimates, the extremities market grew about 8% in Q3 2011 which was similar to Q2 2011. Despite the flat sequential growth and the apparent deceleration in the second half of the quarter, the extremities market remains the fastest growing market in orthopedics."

BMO Capital Market Analyst Joanne Wuensch wrote in an investor note, "Something happened to ortho procedures in the 3Q, hit hard in August, with some recovery in September and into October, creating a cautious 4Q11. While we remain optimistic on the extremities market, it is going to take additional data points to evaluate the trend and see if the 4Q seasonal sales cycle compensates for the deeper 3Q 'seasonality.'"

—WE (November 9, 2011)

legal

Charlotte Orthopods Fined and Suspended

The Charlotte Observer reported on October 25 that two North Carolina orthopedic surgeons and an anesthesiologist have been fined and had their licenses suspended for 18 months after complaints from insurance companies.

According to the story, Chason Spencer Hayes, M.D. and Seth Lewis Jaffe, M.D. both orthopedic surgeons at Carolina Bone & Joint in Monroe and Charlotte, North Carolina, and Neil Michael Goldberger, M.D., the anesthesiologist, performed diagnostic tests that led to immediate surgery, called plasma disc decompression, on seven patients.

Each physician must pay an $85,000 fine, the largest amount levied since the North Carolina Medical Board got authority to issue fines in 2006. The board immediately stayed the suspensions to allow the physicians to continue work.

Andrew Huth/RRY Publications Photo Creation

Consent Orders

A consent order for each physician stated that the board raised several objections to the practice of immediate surgery, saying that it is better to "not have the operating surgeon do both the diagnostic test and the surgery" because it could be a conflict of interest. The board also said none of the seven patients cited had spinal abnormalities that justified having surgery.

The *Observer* story said that in the consent orders, "the board also accused the doctors of unprofessional conduct for sending solicitation letters to personal injury lawyers, advertising the benefits of decompression surgery for people injured in motor vehicle accidents. The board said the letters were provided by ArthroWand, the company that makes devices used for the surgical procedure." The ArthroWand is made by the ArthroCare Corporation.

Board documents said Goldberger performed the diagnostic test, called a discogram, and that most results were positive, indicating patients needed

surgery. Either Hayes or Jaffe would immediately perform surgery, using the ArthroWand to vaporize vertebral disc tissue with electrical current.

"The board has evidence from which it could conclude the physicians' utilization of the...procedure fell below acceptable and prevailing standards of medical practice," the orders said. "Discograms that produce nothing but positive results are invalid."

Accepting Consent Orders a "Business Decision"

The president of Carolina Bone & Joint, Robert Nantais, M.D., told the *Observer* that he disagreed with the medical board conclusion that the decompression procedure does not meet the standard of care. He said accepting the consent order "was a business decision. We wanted to get it behind us and get back to doing what we do best, which is patient care. ... This was not related to patient complaints. The vast majority of our patients did very well."

Insurance Company Complaints

A communications consultant representing the doctors told the *Observer* that the board got complaints from insurance companies who had "financial responsibility for accident-related injuries" that were being treated. The doctors billed an average of $74,500 for each 30-minute procedure. But they were reimbursed an average of $5,642 per patient, board documents say.

The three doctors, according to the consultant stopped performing the surgery in September 2008 after Medicare stopped reimbursing for minimally invasive decompression procedures.

To read the *Observer* article and 72 reader comments, click here:

—WE (November 9, 2011)

biologics

Stem Cells Grow in Plastic Bags

Researchers working in Germany have come up with a solution to a perplexing stem cell problem—how to keep the cell mixtures from becoming contaminated. While doctors have been increasingly using live cells in their treatments of patients—those cells have to be kept, cultivated, reproduced or even modified in a patient-specific manner.

The problem lies in the storability of the cell solutions used. As they can easily become infected by germs, they can only be stored for a few days in the containers conventionally used today.

Investigators from five research institutions, coordinated by the Helmholz Centre for Infection Research in Braunschweig, Germany, together with partners in the industry, have developed innovative plastic surfaces for efficiently producing human cells for diagnostic and therapeutic applications. Their idea was to cultivate the cells in sealed, sterile plastic bags. The inner surface of the bags was modified to provide the cells with good conditions for survival. A team led by Dr Michael Thomas at the Fraunhofer Institute for Surface Engineering and Thin Films IST in Braunschweig, Germany, has developed a plasma technology process for use at atmospheric pressure.

"We fill the bags with a specific gas mixture and apply an electrical voltage" explains Dr. Kristina Lachmann in the November 3 press release. "Inside them, for a brief period, plasma is created, which chemically alters the plastic surface". During this process the bag remains sterile as plasmas, he said, also have a disinfecting action. "The advantage of the process is that it operates at atmospheric pressure and is therefore cost-effective, fast and flexible," said Thomas.

The new bags facilitate the sterile handling of cell cultures. Previously, researchers and clinicians had to use

Morguefile and imelenchon

open Petri dishes, bottles or bioreactors. As these systems need to be opened, at least for filling, contamination can easily occur. By contrast, Thomas notes that when using the new technology with its sealed bag system, the cells migrate directly into the bag via an injection needle or connected tube systems without coming into contact with their surroundings.

The sterile interior of the bags contains a nutrient medium, germ-free air or a suitable gas, which has been added beforehand. Even during the cultivation period the containers do not have to be opened, and at the end the cells can be removed by injection needle, said Thomas.

The researchers believe that they could use the systems for growing artificial organs. If the bags are provided with a three-dimensional structure, cells could attach themselves to it and create artificial skin, nerves, cartilage or bone which could be used prosthetically in the patient.

In collaboration with the University of Tübingen, Braunschweig City Hospital plans to isolate certain stem cells from tissue samples and investigate on which of the new plastic surfaces they could develop into bone or cartilage. For this development by the group led by Thomas, the IST was awarded "Selected Location 2011" as part of the "Land of Ideas" initiative. The prize will be awarded in Braunschweig on December 8, 2011.

—BY (November 9, 2011)

Brits Grow Blood From Stem Cells

Liverpool scientists plan to grow blood from stem cells, obviating the need for blood donors. According to their November 3 press release, researchers at the University of Liverpool are leading a two million pound project developing methods of isolating and purifying haematopoietic stem cells (HSCS), the progenitors of red blood cells, along with the development of specialized environments that will support the transition of HSCs into red blood cells

Wikimedia Commons and JHeuser

The scientists estimate that, in the future, it will take about two weeks to 'grow' a useable amount of blood from HSC's. Looking ahead, they believe that when blood production is fully scaled up to serve health services, production systems should be capable of running continuously, enabling a constant production of red blood cells for clinical use. Researchers are using stem cells from a number of human adult tissue

sources including whole blood, bone marrow, adipose tissue, dental pulp and umbilical cord.

The group is also developing a bioreactor system which will mimic the tissue in the body where blood cells are produced in order to continuously 'harvest' the cells. They say that the system will monitor cell population density, stage of maturation and genotype while providing appropriate nutrition and biomechanical stimulation to encourage the cells to reproduce and 'grow' into red blood cells. Different blood groups will be produced by isolating different groups of HSCs.

Professor John Hunt, Head of the UK Centre for Tissue Engineering at the University, said: "We're aiming to enable the production of large quantities of red blood cells for health care centers in Europe. These will be for immediate use and also for banking in order to reduce the need to rely on blood donations. This will directly benefit patients coming into the hospital, but also alleviate the constant pressures on blood supplies and the need for blood donors. Critical care facilities should be able to establish a blood cell resource based on projected requirements and current demands."

He added: "Producing HSCs on demand will also provide the opportunity to tailor cells, providing for all blood group types, including rare blood cell groups, removing any immunogenicity or patient rejection and reaction issues. The production of specific sub types of cells can also be provided to research groups in order to develop treatments for blood disorders."

The project, entitled 'REDONTAP', is funded by the European Commission and is being conducted in collaboration with Applikon Biotechnology in the Netherlands, the Centre for Tissue and Cell Therapy in Barcelona and the University of Leipzig.

—BY (November 9, 2011)

PRP Use – Still a Question

The jury is still out on the relative effectiveness of platelet-rich plasma (PRP). Laura Miller, writing in Beckers Orthopaedic Spine and Pain Management Review, reported on the outcome of PRP use in five studies. Some reported benefits, others did not.

In one study 37 patients underwent surgery for rotator cuff tears. Sixteen of them received a platelet-rich fibrin matrix during the surgery. The re-tear rate among the group that received the fibrin matrix was 56.2%—significantly higher than that of the control group.

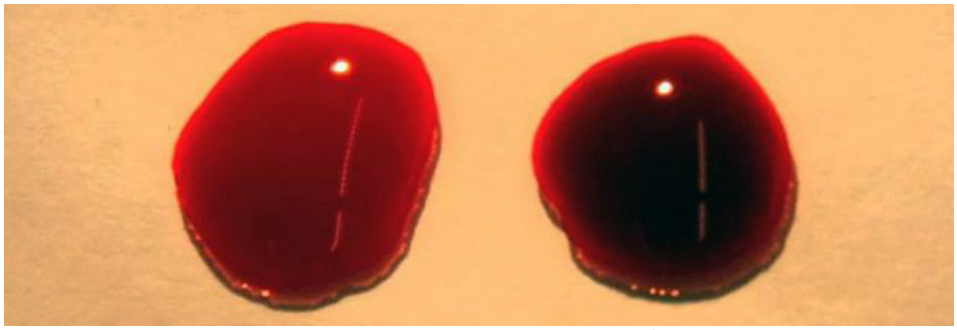
However, a study of arthroscopic rotator cuff tear repairs had a different outcome. Nineteen of 42 patients who had surgery for full-thickness rotator cuff tears received PRP in the form of a gel applied to a suture and placed between the tendon and the bone. While the two groups reported similar pain, range of motion and functional scores, the re-tear rate among the PRP group was lower (26.7%) than was that of the non-PRP group (41.2%).

Applying PRP after a total knee replacement could reduce blood loss, according to a study conducted by Jeffrey Traina, M.D., an orthopedic surgeon at Natchez, Mississippi Community Hospital. Traina examined 81 patients who received PRP after their surgery and found that only 2.4%of the patients needed a blood transfusion postoperatively, compared to typical transfusion rates of 30-50%.

Researchers studying the effect of PRP on tennis elbow (lateral elbow epicondylitis) found that the injections can reduce pain in the short term, when compared with whole blood injections. However, by the six-month follow-up, the scores of the PRP group equalized with those of the control group. There was no significant difference in the elbow function of either group.

Finally, a study of a randomized, controlled trial of platelet-rich plasma injections to repair a damaged Achilles tendon showed no clinical or ultrasonographic advantages over a placebo injection. Researchers examined 54 patients with chronic tendinopathy. Both groups experienced improvement after one year, although neither showed significant improvement over the other

—BY (November 9, 2011)



Drops of blood. Source: Wikimedia Common

large joints

Stanford Study Revolutionizing OA?

Early help for osteoarthritis (OA) sufferers? Stanford University School of Medicine researchers have shown that the development of osteoarthritis is in great part driven by low-grade inflammatory processes—a shift from the established viewpoint that OA is caused by a lifetime of wear and tear on long-suffering joints.

"It's a paradigm change," said William Robinson, M.D., Ph.D., the study's senior author, of the implication of the findings, in the November 7, 2011 news release. "People in the field predominantly view osteoarthritis as a matter of simple wear and tear, like tires gradually wearing out on a car." These findings offer hope that by targeting the inflammatory processes that occur early on in the development of osteoarthritis—well before it progresses to the point where symptoms appear—the condition might someday be preventable.

Wikimedia Commons and James Heilman, M.D.

The new study showed that initial damage to the joint sparks a chain of molecular events that escalates into an attack upon the damaged joint by one of the body's key defense systems against bacterial and viral infections, the so-called complement system. Upon activation of the complement cascade these proteins engage in a complex interplay, variously enhancing or inhibiting one another's actions at certain points and culminating in the activation of a protein cluster called the MAC (for "membrane attack complex"). By punching holes in the membranes of bacterial or virally infected human cells, the MAC helps to clear the body of infections.

Dr. Robinson's group also examined the activity level of genes in joint-lining tissues of osteoarthritic versus healthy subjects, and observed a similar result: more expression of genes encoding complement-activating and related inflammatory proteins, and less expression of genes encoding complement- and inflammation-inhibiting ones, in the osteoarthritic patients' joint tissues.

They also induced the equivalent of meniscal tears or removal in mice who (like humans) are much more prone to getting osteoarthritis in joints that have suffered such damage. The normal mice developed osteoarthritis as expected. But the two strains of bioengineered mice lacking a complement-cascade-accelerating protein developed less-severe arthritis, while the mice lacking the complement-inhibiting protein got worse, faster.

Further experiments in mice and with human tissue showed that the MAC was binding to cartilage-producing cells in these tissues and causing them to secrete still more complement-component proteins as well as other inflammatory chemicals, and other specialized proteins, or enzymes, that chew up the matrix of cartilage occupying the spaces between cells. They demonstrated that breakdown products of cartilage destruction, including one called fibromodulin, can directly activate the complement system, fostering a continuing cycle of joint-tissue damage.

Finally, the investigators showed that these insults inflicted by the complement system were mirrored by functional impairment. Bioengineered mice lacking a key complement-component protein, without which the complement system fails to activate, maintained their ability to walk normally, while normal mice developed a hindered gait due to severe osteoarthritis following meniscal injury.

—EH (November 10, 2011)

extremities

Eureka! Periprosthetic Joint Infection Defined

The Musculoskeletal Infection Society working group, led by Javad Parvizi, M.D., director of Research at the Rothman Institute at Jefferson, has developed the orthopedic community's first-ever agreed upon definition and diagnostic criteria for periprosthetic joint infection (PJI). To date their proposed criteria has been evaluated and endorsed by the Knee Society, the Hip Society, the Infectious Disease Society of North America (IDSNA), the American Association of Orthopedic Surgeons (AAOS) and the Centers for Disease Control (CDC).

"Our aim was to develop a 'gold standard' definition to serve as a roadmap for diagnosing patients with suspected PJI that could be universally adopted by the industry," said Dr. Parvizi in the November 3, 2011 news release.

The group's recommendations include sterile sampling of the periprosthetic tissue or fluid for the presence of virulent organisms, such as Staphylococcus aureus (S. aureus), the culprit in staph infections; and testing the blood serum surrounding the joint for elevated levels of known biomarkers for systemic inflammation and infection, C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR). They recommend certain considerations as the level of serum markers is affected by age, sex and medical comorbidities.

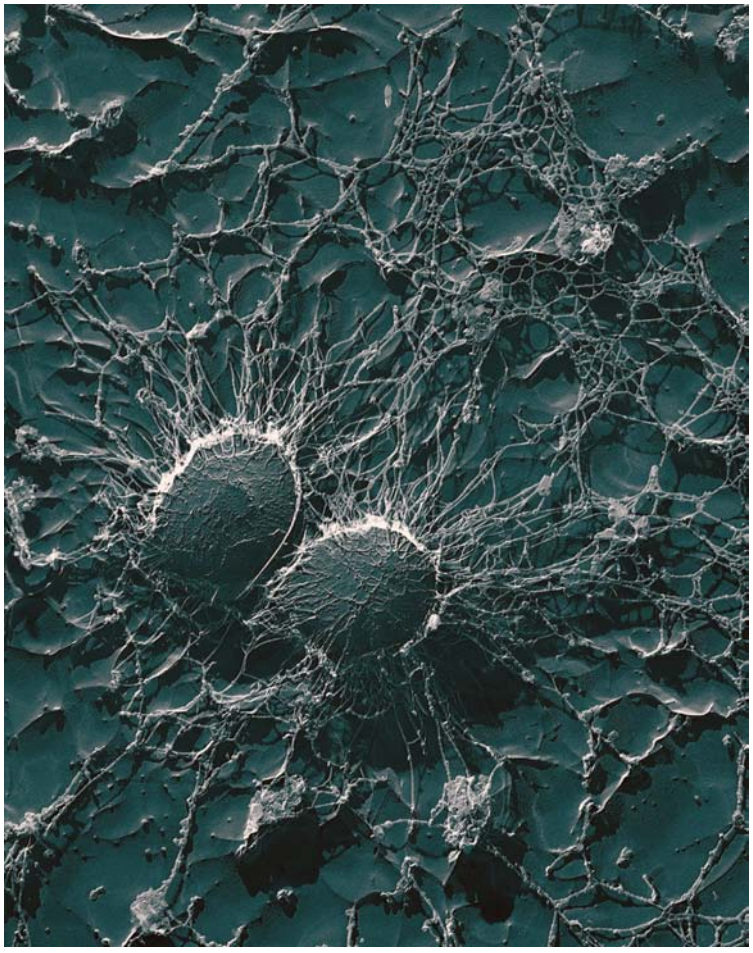
Aspiration and supplementary testing of the synovial fluid, the viscous liquid that lubricates the joints and feeds the cartilage is suggested to look for elevated white blood cell counts, specifically the percentage of neutrophils (PMN%), plentiful in infected bone marrow.

The appearance of the joint during surgery, presence or absence of a sinus tract, and the result of histological analysis of tissue obtained during surgery (frozen section) are also recommended to consider in diagnosing PJI.

"Patients with PJI could suffer unintended consequences if their infection is not identified and treated hastily," said Dr. Parvizi. "Without an industry-wide definition, research, diagnosis and treatment cannot be uniform."

Numerous other Jefferson research studies are underway that will help fine-tune the recommendations in the future.

"It's important to get to the root of the cause of PJI so that we can begin to get ahead of it at Jefferson and across the industry and turn the tide," said Dr. Parvizi. "Using this definition, we will now be more confident in our diagnosis and be able to provide appropriate treatment for patients."



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Dr. Parvizi told *OTW*, "The main challenge in the process of developing the new definition was the evaluation of literature and distilling what was scientifically vigorous and valuable for inclusion. The other challenge, that still remains to some extent, is defining the exact 'normal' parameter for each test. The latter is unlikely to be accomplished anytime soon as 'normal' values defined for each test depends on so many parameters that cannot be controlled universally and likely to vary from a patient to another patient and from an institution to another."

—EH (November 11, 2011)

reimbursement

Medicare Wants Input to Improve Coverage

Let's say you have a new medical technology that might improve health outcomes for the Medicare population.

Morguefilet

So you apply for Medicare coverage, but your evidence is not strong enough to support a determination for coverage. However not getting coverage means you don't have enough money to develop the evidence needed to conduct the studies that can better define the patient population that will benefit the most from your technology.

The Centers Medicare and Medicaid Services (CMS) has a program called "Coverage With Evidence Development" (CED) that addresses this dilemma. The agency wants your comments about improving the program.

Coverage with evidence development is the mechanism CMS can use to provide conditional payment for items and services while generating clinical data to demonstrate their impact on health outcomes.

The agency says while CED has produced some gains in innovation, their experience over the last few years indicates the agency still has room to improve the CED process. The goal is to improve health outcomes for Medicare beneficiaries. CMS believes that public input should inform this effort and is inviting your comments concerning CED.

The agency asks that you comment on the following areas:

- Implementation of CED through the national coverage determination (NCD) or other avenues under Part A and Part B
- Potential impact of CED on the Medicare program and its beneficiaries
- Suggested approach to CED to maximize benefit to Medicare beneficiaries

CMS will weigh public input on CED with internal lessons learned to develop a guidance document that better aligns CED with the rapidly evolving changes in the healthcare system. Their intended outcome is to mature CED so that it fulfills its potential as a mechanism that simultaneously reduces barriers for innovation and enables CMS to make better informed decisions that improve health outcomes for Medicare beneficiaries.

The current CED guidance document is being removed with this request for comments. The agency will collect comments on CED through January 6, 2012. CED continues to remain in place during this review.

Instructions on submitting public comments can be found at: https://www.cms.gov/medicare-coverage-database/details/medicare-coverage-document-details.aspx?MCDId=8

You may submit a public comment by clicking on the highlighted word COMMENT at the top of the CMS page.

—WE (November 9, 2011)

spine

Integra Introduces New Spine Devices

On November 2, 2011, Integra LifeSciences Holding Corporation announced the launch of a new IBD, the Complete Cervical Intervertebral Body Fusion Device, and the expanded market introduction of the Daytona Deformity Spinal System together with the Stainless Steel Spinal System, both of which were previously released on a limited basis in 2010.

IBDs are small, hollow spinal implants that are inserted into the intervertebral space to restore physiological disc height and allow fusion between vertebral bodies, explain company officials. These devices relieve pressure on the nerves and help provide mechanical stabilization of the vertebrae. The graft window in the device is packed with bone and provides an environment in which natural bone growth can occur, which then enables fusion of the vertebral segments. Integra officials describe its IBD as a zero-profile, stand-alone device designed to provide stability for spinal fusion after a diseased cervical disc has been removed. The device has received 510(k) clearance from the FDA.

Company officials explain that, traditionally, surgeons have used a supplemental fixation plate to hold the IBD in place. The Integra Complete Cervical IBD differs in that it features a zero-profile design that utilizes two screws to help secure the IBD in its functional position, which eliminates the need for a supplemental fixation plate. "This concept is ideal for a cervical discectomy as it may lead to less tissue dissection and retraction, said Abid Qureshi, M.D., who calls the device "tissue friendly."

Integra officials describe the company's two products, Daytona Deformity Spinal System and the Stainless Steel Spinal System as solutions for spinal deformity correction procedures. They say that both systems may be used to address standard to complex deformity cases for adult patients. Integra's stainless steel system is designed for surgeons who prefer a stiffer and stronger construct.

"Deformity correction is a specialized segment of the spinal fixation market, where cases are often complex and outcomes may be life-changing," said Raymund Woo, M.D., from Orlando, Florida. "Depending on the patient's condition, different rod materials are needed, including titanium alloy, stainless steel or cobalt chrome."

Integra LifeSciences Holdings Corporation was founded in 1989, is headquartered in Plainsboro, New Jersey and has over 3,000 employees worldwide.

—BY (November 9, 2011)

Intrgra and RRY Publications Photo Creation

Squat Lift Exercise Bad for Spines

A routine training exercise, the squat lift, popular with coaches, may be putting hazardous stress on athletes' spines, according to a report by John Fauber in the November 4 ***Milwaukee Journal Sentinel***. Researchers reported that even when young athletes use correct form in doing squats they are risking a hard-to-heal stress facture of the posterior lumbar spine structure known as the pars interarticularis. Once a pars fracture occurs, the chance of it healing is as low as 2%, the researchers said.

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Lead study author Dr. John McClellan, a pediatric and adult spine surgeon at the Nebraska Spine Center in Omaha, said, "These are high-risk lifts whether you're a child or an adult. For years, coaches have blamed spinal fractures on kids' poor weightlifting techniques. We wanted to put that theory to the test."

McClellan and his co-researchers enlisted 20 athletes in their 20s and took X-rays of them in various positions, including normal standing as well as doing front and back squats. They used a bar and weights totaling 95 pounds.

The most alarming finding they identified was a change in the slope of the sacrum during a back squat, when the bar was across the upper back. The average sacral slope increased from

41 degrees in normal standing to 68 degrees while doing a back squat and 58 degrees while doing a front squat, when the bar was across the clavicles. The researchers found that squats significantly increase the slope of the sacrum and the alignment of the spine, resulting in a "horizontalization" of the sacrum.

McClellan said that he has seen more than 500 kids with pars fractures and often they remember hurting themselves doing squats. Squats are used in training for many high school sports and some kids start doing the exercises by age 13. While coaches may blame the injuries on bad form, now, said McClellan, there is evidence that doing squats with good form also can put the spine at risk.

Changing the attitudes of coaches and trainers is difficult, warned Michael Reed, Ph.D., a physical therapist who specializes in the spine and practices at the Hospital for Special Surgery Spine and Sport in Jupiter, Florida. The problem is that, Reed said, while squats can be very risky, they are effective at strengthening muscles. Nevertheless, "even the best form will not protect you," he added. Reed doubts that parents realize how risky squats are and that they rely on coaches and trainers who do not fully understand the risks involved.

—BY (November 9, 2011)

Spinal USA Introduces New Devices

Spinal USA, headquartered in Pearl, Mississippi, introduced two of the firm's new spinal treatment devices at the November meeting in Chicago of the North American Spine Society (NASS).

Image creation by RRY Publications, LLC. Source: Spinal USA

The two technologies, which recently received FDA 510(k) clearance, are the Vault Stand Alone ALIF System and the S-LOK *PC* Posterior Cervical System.

Company officials say that the VAULT Stand Alone ALIF System, designed for use with autogenous bone graft, is indicated for intervertebral body fusion of the spine in patients with degenerative disc disease with up to Grade I spondylolisthesis. It is intended for use at either a single level or at two contiguous levels between L2 and S1 in the lumbar spine. The System is designed to provide immediate mechanical fixation to adjacent vertebral bodies while maintaining a zero profile, and features a large graft window designed to maximize the opportunity for successful fusion.

The S-Lok *PC* Posterior Cervical System is intended, according to the October 28 press release, to promote fusion of the cervical and thoracic spine in skeletally mature patients and is indicated for use in the treatment of degenerative disc disease, spondylolisthesis, spinal stenosis, fracture/dislocation, revision of previous cervical spine surgery and tumors. The system's components include polyaxial screws with up to 40º of angulation for placement in the upper thoracic spine, and an array of lateral offsets, hooks, dominoes, transition rods and crosslinks designed to provide stabilization to promote fusion in the cervical/upper thoracic spine.

"These two technologies represent very important product line additions for Spinal USA," said Rich Dickerson, Sr. VP Operations. "By providing a single product indicated for cases previously requiring up to two separate products, the VAULT System has the potential to reduce surgical trauma and yield a net cost savings. The S-Lok *PC* System is designed to offer surgeons a comprehensive fixation system with enhanced ease of use and greater intraoperative flexibility." Spinal USA, LLC is a privately held company founded in 2005.

—BY (November 9, 2011)

NASS Presentation: Vitamin D and Recovery

A new study—one that was selected as one of the best papers at the

2011 meeting of the North American Spine Society (NASS)—indicates that many patients undergoing spine surgery have low levels of vitamin D, which may delay their recovery.

In a study of 313 patients undergoing spinal fusion surgery, orthopedic surgeons at Washington University School of Medicine in St. Louis found that more than half had inadequate levels of vitamin D, including one-fourth who were more severely deficient.

"Our findings suggest it may be worthwhile to screen surgery patients for vitamin D," said Jacob M. Buchowski, M.D., the study's principal investigator, in the November 3, 2011 news release. "We think those with insufficient levels of vitamin D may benefit from taking 50,000 international units of the vitamin once a week for eight weeks before surgery as this may help the recovery after spinal fusion surgery."

Buchowski became aware of the vitamin D problem when a patient in her 40s experienced a slow recovery after spinal fusion surgery. "I was examining her and trying to figure out why the vertebrae didn't fuse," he added. "She mentioned that she had recently been diagnosed with vitamin D deficiency, and it was like a 'light bulb' went off."

"We rarely think about deficiency in younger patients," Buchowski stated. "More of the older patients in this study had a history of taking supplements, and as a result, they had less risk for vitamin D deficiency than younger patients."

The researchers found that the main risk factors for inadequate vitamin D were smoking, obesity, disability prior to surgery and never having taken vitamin D or multivitamin supplements.

Buchowski and his colleagues are planning a study to see whether there is a link between low vitamin D and poor outcomes following spinal fusion. In the meantime, he's recommending that patients having orthopedic surgery ensure they're getting enough vitamin D.

"Vitamin D is inexpensive and easily stored in the body," Buchowski added. "My hunch is that having adequate levels may help the spine fuse following surgery."

To maintain bone health and normal calcium metabolism, the Institute of Medicine established a recommended daily allowance (RDA) for vitamin D of 600 international units. Buchowski says patients should work with their doctors to determine what supplemental level is appropriate for them.

—EH (November 8, 2011)

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