VOLUME 11, ISSUE 33 | OCTOBER 20, 2015

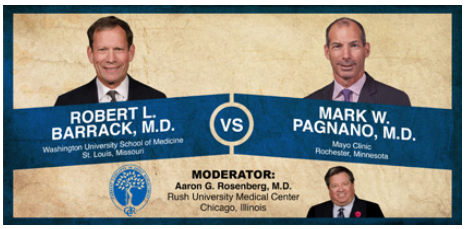
Orthopedics This Week

WEEK IN REVIEW

4 ICD-10 Code Follies >> Type A personalities, opera house accidents, water-skis on fire and sibling rivalry. These are but a few of the new ICD-10 codes which are, yes, billable and are perfectly appropriate descriptor codes for whatever ails your patient. We call it the ICD-10 follies.

9 Radd Berrett: From Orthopedics to International Child Rescue >> When Radd Berrett sold his orthopedic companies he had visions of a relaxing retirement. Fate took a hand, however, and now he is a hero to some of the world's most desperate children. Read how this former industry executive travels the world to rescue children from a life of sex trafficking.

12 Barrack v Pagnano: Patient Specific Cutting Blocks: Of Unproven Value >> Patient Specific Instrumentation (PSI), unproven value or next new thing for knee replacement surgery? Dr. Barrack says he's tried it and it didn't improve outcomes or value. Dr. Pagnano counters by saying that in his experience PSI lowers stress in the OR and is valuable for certain hospitals. Another timely and important debate from CCJR.



16 New Spine Hospital More Like 5-Star Hotel // Clever Prep-Book Bolsters Orthopedic Exam Success // 12 Year Data Supports Lateralization of Reverse Shoulder Implants >> Patients stepping into the new Spine Hospital in New York just may think they are in a 5-star hotel. A new book takes a vignette-based approach to acing the Orthopedic Board Exam. And 12 years' worth of data from Mark Frankle, M.D. says that lateralization of reverse shoulder prostheses does not lead to implant failure.

BREAKING NEWS

20 DePuy Synthes' Third Quarter Needs a Band-Aid

HSS Orthopaedic Residency **Top Ranked** by Doximity (2nd Year in a Row)

AAOS Taking on **Opioid Epidemic**

Only the Brave…AOFAS Course Like No Other

In Memoriam: **Christoph Röder, M.D., Ph.D., M.P.H.**

In Memoriam: **Leon Root, M.D.**

For all news that is ortho, read on.

Orthopedic Power Rankings

Robin Young's Entirely Subjective Ordering of Public Orthopedic Companies

THIS WEEK: The tone of most analyst comments after last week's NASS was positive—even in the face of low single-digit expected spine sales growth. Medtronic, the largest spine company, did not attend NASS. Yet MDT's spine market share improved and Infuse sales are higher. Wall Street's overall tone is cautious. NO surprise that the average market cap of the top 10 performers is $45 billion while the average market cap for the 10 worst performers is $538 million. When investors are nervous, they gravitate to size and quality.

RANK	LAST WEEK	COMPANY	TTM OP MARGIN	30-DAY PRICE CHANGE	COMMENT
1	7	Zimmer Biomet	30.35%	(2.18%)	ZBH is now the 3rd least expensive ortho equity and is in oversold territory. Combining price and fundamental value, ZBH is the new #1 in the PR.
2	1	Stryker	22.78	(0.57)	Investors like SYK in these uncertain times and at these prices (5th least expensive ortho equity) is now #2 on the PR.
3	3	Integra LifeSciences	13.74	(8.05)	The October general investor malaise will come to an end and stocks like IART, which have sold off, will bounce back.
4	5	Exactech	10.26	(6.15)	On all our valuation measures EXAC is uniquely and notably cheap. For example: THE lowest P/E. 2nd lowest PSR. 3rd lowest PEG.
5	4	Johnson & Johnson	28.44	3.84	Capital has flowed like a river into JNJ during these uncertain economic times. Eventually the pricing pendulum over swings. We're getting close.
6	9	RTI Biologics	7.50	(16.86)	Oooph! Big hit but this micro-cap stock is the kind of equity that benefits from the "January Effect" which tends to start in December.
7	2	Smith & Nephew	20.19	(1.49)	On a comparative basis, SNN is performing well as an equity, but the side effect is that valuation is less attractive.
8	6	Medtronic	27.92	5.69	Top performer. NASS's lack of impact on MDT spine's sales is interesting. Valuation, however, puts MDT near the bottom of the PR.
9	8	Orthofix	2.35	(8.09)	With OFIX in transition, analysts are recalibrating their estimates for 2016 and beyond. The risk/reward trade off favors reward.
10	NR	ConMed	10.78	(3.77)	Back on the Power Rankings after a comparatively strong showing among investors. New Prez of Ortho announced.

Robin Young's Orthopedic Universe

TOP PERFORMERS LAST 30 DAYS

	COMPANY	SYMBOL	PRICE	MKT CAP	30-DAY CHG
1	CryoLife	CRY	$10.38	$308	8.35%
2	Medtronic	MDT	$74.11	$104,763	5.69%
3	MicroPort Scientific	853	$0.42	$596	4.86%
4	Johnson & Johnson	JNJ	$98.24	$272,037	3.84%
5	Stryker	SYK	$100.03	$37,667	-0.57%
6	Smith & Nephew	SNN	$35.78	$16,011	-1.49%
7	Zimmer Biomet	ZBH	$98.54	$20,040	-2.18%
8	ConMed	CNMD	$49.58	$1,373	-3.77%
9	Globus Medical	GMED	$23.25	$2,210	-3.77%
10	Exactech	EXAC	$18.00	$253	-6.15%

WORST PERFORMERS LAST 30 DAYS

	COMPANY	SYMBOL	PRICE	MKT CAP	30-DAY CHG
1	LDR Holding Corp.	LDRH	$26.62	$772	-31.00%
2	Alphatec Holdings	ATEC	$0.37	$37	-24.41%
3	MiMedx Group	MDXG	$8.32	$906	-21.21%
4	TiGenix	TIG.BR	$1.03	$173	-17.95%
5	RTI Biologics Inc	RTIX	$5.08	$293	-16.86%
6	SeaSpine Hldgs Corp.	SPNE	$15.62	$174	-16.34%
7	Aurora Spine	ASG	$0.19	$5	-15.07%
8	Wright Med Grp N.V	WMGI	$21.17	$2,202	-13.27%
9	Xtant Medical Hldgs	BONE	$3.25	$38	-12.16%
10	K2M Group Hldgs	KTWO	$18.83	$778	-11.80%

LOWEST PRICE / EARNINGS RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	P/E
1	Exactech	EXAC	$18.00	$253	16.07
2	Johnson & Johnson	JNJ	$98.24	$272,037	17.18
3	Globus Medical	GMED	$23.25	$2,210	17.90
4	Zimmer Biomet	ZBH	$98.54	$20,040	17.92
5	Stryker	SYK	$100.03	$37,667	22.22

HIGHEST PRICE / EARNINGS RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	P/E
1	CryoLife	CRY	$10.38	$308	86.79
2	NuVasive	NUVA	$49.60	$2,427	79.21
3	MiMedx Group	MDXG	$8.32	$906	55.47
4	Smith & Nephew	SNN	$35.78	$16,011	31.96
5	RTI Biologics Inc	RTIX	$5.08	$293	29.40

LOWEST P/E TO GROWTH RATIO (EARNINGS ESTIMATES)

	COMPANY	SYMBOL	PRICE	MKT CAP	PEG
1	Globus Medical	GMED	$23.25	$2,210	1.46
2	Zimmer Biomet	ZBH	$98.54	$20,040	1.60
3	Exactech	EXAC	$18.00	$253	1.81
4	RTI Biologics Inc	RTIX	$5.08	$293	1.96
5	ConMed	CNMD	$49.58	$1,373	1.98

HIGHEST P/E TO GROWTH RATIO (EARNINGS ESTIMATES)

	COMPANY	SYMBOL	PRICE	MKT CAP	PEG
1	NuVasive	NUVA	$49.60	$2,427	5.33
2	MiMedx Group	MDXG	$8.32	$906	3.70
3	Medtronic	MDT	$74.11	$104,763	3.67
4	Johnson & Johnson	JNJ	$98.24	$272,037	3.46
5	CryoLife	CRY	$10.38	$308	2.89

LOWEST PRICE TO SALES RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	PSR
1	Alphatec Holdings	ATEC	$0.37	$37	0.18
2	Exactech	EXAC	$18.00	$253	1.02
3	Xtant Medical Hldgs	BONE	$3.25	$38	1.08
4	RTI Biologics Inc	RTIX	$5.08	$293	1.11
5	SeaSpine Hldgs Corp.	SPNE	$15.62	$174	1.25

HIGHEST PRICE TO SALES RATIO (TTM)

	COMPANY	SYMBOL	PRICE	MKT CAP	PSR
1	TiGenix	TIG.BR	$1.03	$173	27.56
2	MiMedx Group	MDXG	$8.32	$906	7.66
3	Wright Med Grp N.V	WMGI	$21.17	$2,202	6.38
4	Medtronic	MDT	$74.11	$104,763	5.17
5	LDR Holding Corp.	LDRH	$26.62	$772	5.17

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

ICD-10 Code Follies

BY ROBIN YOUNG

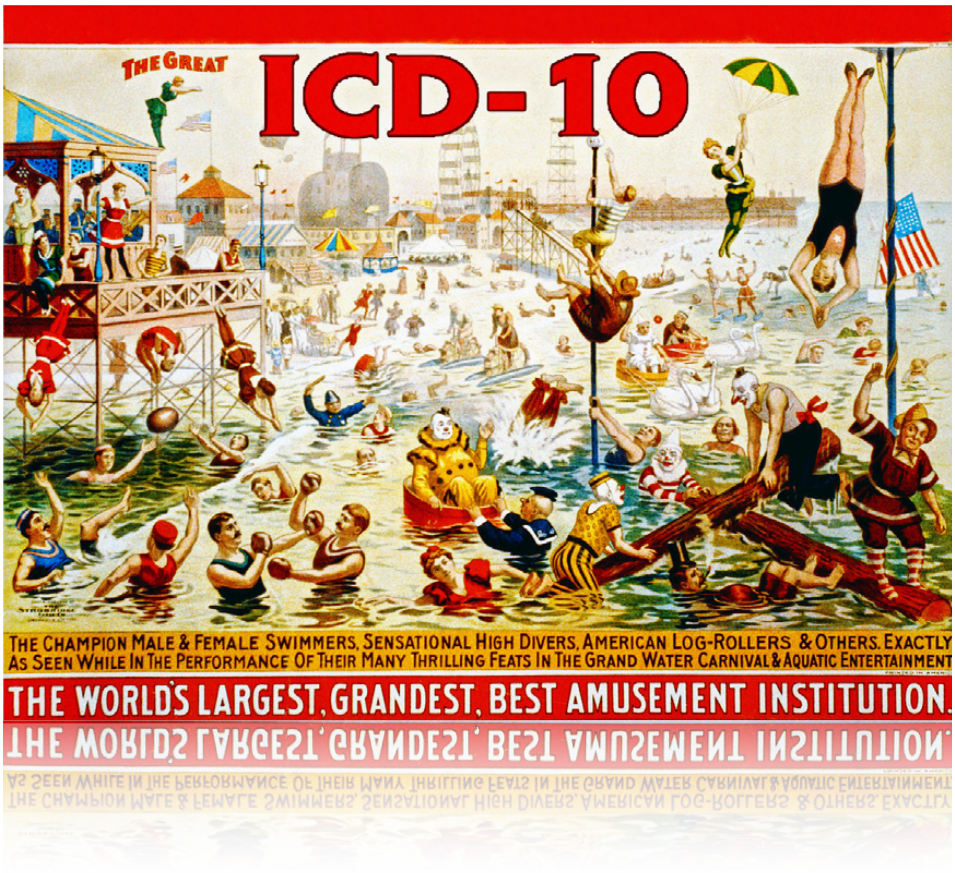
ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD) which is a medical classification list developed by the World Health Organization for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

The international code set allows more than 14,400 different codes and permits the tracking of many new diagnoses. The U.S. version of these ICD-10 codes has more than 68,000 codes.

These are replacing the older ICD-9 codes.

The updating of the ICD-9 codes actually began in 1983. And over the years more and more code ideas were included in the master list—including some real head scratchers.

Here are some of our favorite humdingers.



RRY Wikimedia commons and BotmultichillT

Burn due to water skis on fire: *V91.07xD*

Next time that ER nurse doubts your word when you say the water ski's caught fire just look them in the eye and say "V91.07xD"!

Yeah, it could happen.

Courtesy of Six Wonder Lake ski team and Team U.S.A.

Other contact with shark: *W56.49*

There are people who claim sharks like to be petted—like dogs. In case your shark doesn't agree, there's an ICD-10 code to cover what happens next.

Courtesy of Steamer.co.il.

Hunting rifle discharge, undetermined intent: *Y23.1*

Also known as the Cheney Code.

Courtesy of NBC News

Inadequate social skills, not elsewhere classified: *Z73.4*

Good social skills and mental health go hand in hand. Hollywood has mined the comedic possibilities of what is, in reality, a serious problem for many people in shows like Seinfeld or movies like "What About Bob?"

Still, when it's needed, there's a code for that.

Courtesy NBC News

Sibling rivalry: *Z62.891*

Our guess is that this is for the parents. Not the kids. "Why are you here?" says the ER nurse. "Sibling rivalry," says the Mom. No problem, we have a code for that. And a spa.

Courtesy of add adhd advances

Struck by Orca, initial encounter: *W56.22xa*

The vast majority of encounters with Orcas occur in the splash zone at Sea World. Maybe these smart mammals are trying to tell us something.

Courtesy of Orlando Fun Tickets

Bizarre personal appearance: *R46.1*

"Honest doctor, I was driving along and this guy with a blue face jogged by. Unbelievable! That's why I hit the tree." No problem. We've got your code.

Wikimedia Commons and Tuerto

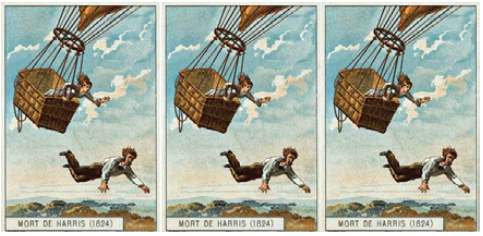
Activity, knitting and crocheting: *Y93.D1*

A little bit of research uncovered one case, from 1966, where a knitting basket was left open, a child fell into it and was speared by one of the knitting needles. That was nearly 50 years ago. So, we're due. And with code Y93.D1, we're ready.

Wikimedia Commons and Johntex

Unspecified balloon accident injuring occupant, sequela: *V96.00XS*

Seat belts. That's all we're saying.



Wikimedia Commons

Prolonged stay in weightless environment: *X52*

Always the muscle atrophy. But hair. Whoever mentions weightless hair? No one. Finally we have a code to deal with epically unruly hair.

Wikimedia Commons and NASA

Opera house as the place of occurrence of the external cause: *Y92.253*

In 1905 a bridge on Metropolitan Opera stage collapsed, injuring nine actors. Interestingly, the opera resumed a few minutes later—once the injured were carted off. The audience stayed in their seats through it all!

Should that ever happen again, we now have the proper ICD-10 code.

Wikimedia Commons and Forbes Col, Boston

Type A behavior pattern: *Z73.1*

President Trump. What Z73.1 was made for.

Wikimedia Commons and Michael Vadon

Final Thoughts

Actually dealing with the ICD-10 transition is no laughing matter—because it adds a significant amount of new detail and complexity to the coding process. Ironically and humorously, the bureaucratic impulse to over regulate also created these truly funny, ludicrous and illogical codes.

There are more. We only selected a few. Perhaps we'll put together another group of priceless ICD-10 codes for another day. ◆

Radd Berrett: From Orthopedics to International Child Rescue

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

Members of the broader orthopedic community are famous for leaping into action when disaster strikes. When earthquakes decimated Haiti, dozens of orthopedists, nurses, and even sales reps and executives volunteered to help. And, without fanfare, hundreds of people in the broader orthopedic community volunteer their time, instruments, implants, machines and other resources to go to remote corners of the world to provide free care to those who need it the most.

Watch it here: https://www.youtube.com/watch?v=kVhuymUgyyc

But the story of Radd Berrett, a 51-year-old retired orthopedic industry executive, is truly one of a kind.

Berrett, a single father, had just sold his neuromonitoring company, his orthopedic distributorship and his MRI facility in 2014 and was ready to retire—or at least shift into low gear.

But fate had other plans.

Saving the Lost Children

As Berrett told *OTW*, "I attended a political event with my friend Sean Reyes, who is now the Attorney General of Utah. They had set aside time for a man named Tim Ballard, a former CIA and Homeland Security Agent who had started an international child sex slavery rescue organization—Operation Underground Railroad. (O.U.R. Rescue). After listening to Tim's compelling stories of children in horrible situations who could indeed be saved, I was hooked."

A few weeks later Radd Berrett saw a private screening of a film called The Abolitionists. Made by Gerald Molen, the producer of Shindler's List, the film tells the story of Tim Ballard and his operatives on their first mission. "It ripped my heart out," says Berrett. "Over the next few months I got to know Tim and asked how I could help. 'Join the jump team,' he said."

The jump team is a rugged group of individuals—many of whom are former SEALS, CIA, and FBI agents—who head into situations where children are being trafficked for sex. Radd Berrett: "Seven months later and countless hours of training I am now a member of the 'jump team.' I also serve as the Director of Corporate Affairs."

Setting up Sting Operations

Part rescuer, part actor, Berrett works with the team to set up sting operations to apprehend the traffickers. "We pose as wealthy businessmen who fly in for sex parties. And our people never go into any country without involving the local and/or federal police. This all has to be 'by the book' because these people have to be prosecuted. Everything is filmed and our team is all miked up."

"The trainers always say that they can train us on tactics, but that we have to be in a specific mental 'space' in order to go undercover and act like a pedophile. Most of the ex-military guys just want to reach over and rip the trafficker's head off, so obviously they have to work through that in order to do follow the script."

"We have decades of combined undercover sting experience. When doing the set ups we make it clear to the traffickers that our guys are wealthy, high profile people, and that safety and anonymity are critical. We make sure they know that if any of their people show up with weapons, drugs, or recording devices then the deal is off. Our people pat everyone down, so no one has ever pulled a weapon on us. We have established 'safe' words and a 'panic' word. And in the end, to preserve our cover, we are handcuffed and thrown to the ground with everyone else. The local and/or federal police then get to take credit for the bust."

According to the organization's founder, Tim Ballard, "In order to dismantle these trafficking rings, we do our research, coordinate with local authorities, rescue the children, make sure the perpetrators are arrested, and then ensure long term care for the children. We monitor the prosecutions and engage in the training of local forces so that they are ready for future missions. And because we are a private agency, we are free from the burdens of bureaucracy."

Saved Over 300 Children

To date, Operation Underground Railroad has saved well over 300 children and apprehended 48 sex traffickers; missions have been carried out in 12 countries, including the U.S.

Berrett says, "Our most resounding successes have been in Columbia, where the authorities are very receptive, motivated, and glad to have help in fighting the child sex trafficking problem. We have worked with the federal government there on the several occasions; at one point three of their top undercover agents and two psychotherapists came to the U.S. and spent a week undergoing forensic and other kinds of training."

"The most astounding things are the statistics. The fact that the majority of demand for child sex emanates from the U.S. and Canada is disconcerting. There is a huge volume of child porn that drives child sex slavery. Fortunately, the U.S. government has an amazing software that utilizes a Globally Unique Identifier (GUID) that can be used to track downloads. When federal agents go into this area of the Internet (the 'Dark Web') they download child porn and embed it with a GUID. Then, when that video is downloaded or shared anywhere in the world it 'pings' and they're able to identify the URL and determine its exact location. One day I watched a video of when they first did this tracking. There was a wall-size atlas and every time one of those videos was downloaded or shared a light would come on. It was like watching something in Hollywood…within 90 seconds another light would appear, then 60 seconds later another would come on, etc. It took less than five minutes for hundreds of lights to illuminate all across the world. Sickening, really."

Asked if they were ever unable to take a mission to the point of prosecution, Berrett says, "The very first undercover operation I did was in Haiti. A few weeks prior, a Christian aid group was bringing in supplies and someone in their group brought a drone to film them helping the children. Well, during this time, someone on their team set

the drone down to make some adjustments…and all the while it was filming. By chance, it caught images of a man raping a 4 year old boy (and there were accomplices). The aid group sent us these images and we presented the video to a judge. He gave us the green light to go undercover and get the guy, which we did. In the end, however, once we were all in the courtroom the child's mother would not press charges. The judge let him go right in front of us."

One extremely successful mission took an unexpectedly positive turn, says Berrett. "There were 53 kids in a horrific facility fronting as an orphanage; they were all for sale. We set up a sting to pay $7,500 each for two children… a brother and sister who were 4 and 5 years old. That little boy leapt into one of my colleague's arms…it was like he knew he was there to save him. We were able to rescue *all* of the children… and my jump team partner and his wife are adopting that little boy, as well as his sister."

True Heroes, Massive Hearts

Radd Berrett wasn't prepared for the effect that O.U.R. would have on him. "After one mission we had gotten the kids settled in with people running a safe, loving orphanage. My teammates and I spent three hours there playing with the kids…running and jumping and having so much fun laughing with them. Then it came time to leave. The kids were all smiles, but my heart was tearing. I forgot that there was a GoPro camera in the car and it caught me crying like I haven't cried in 30 years. They were fundamentally tears of joy for these children. Overall, I have never done more emotionally satisfying work."

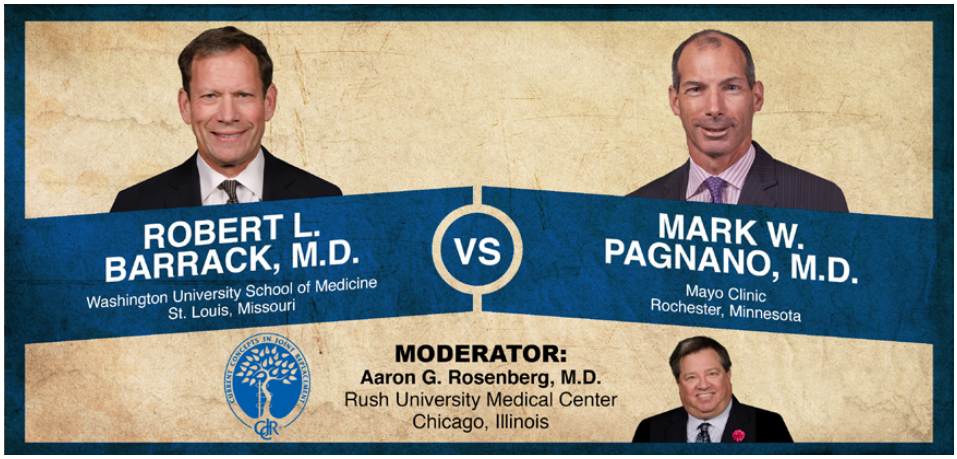
Sean Reyes, Attorney General of Utah, has nothing but praise for his friend who jumped into the fray to help little ones. "Radd Berrett has taken the same drive, dedication and work ethic that made him a success in the business community to become an effective force in fighting human trafficking. He has given selflessly of his time and money to disrupt this evil practice not only in the U.S. but around the world. He has become an integral player in the liberation of thousands of little boys and girls from the clutches of child sexual trafficking rings. And he has shown an incredible gift for helping survivors of these atrocities on their long road to recovery and healing. We need more men and women with the character and compassion of Radd Berrett to be effective in our global battle against the evil scourge of sex trafficking."

If you'd like to support Radd Berrett and this team, go to this website and donate or volunteer: https://ourrescue.org/ ♦

Barrack v Pagnano: Patient Specific Cutting Blocks: *Of Unproven Value*

BY OTW STAFF

This week's Orthopaedic Crossfire® debate was part of the 16th Annual Current Concepts in Joint Replacement® (CCJR) – Spring meeting, which took place in Las Vegas this past May. This week's topic is "Patient Specific Cutting Blocks: Of Unproven Value." For the proposition is Robert L. Barrack, M.D., Washington University School of Medicine, St. Louis, Missouri. Mark W. Pagnano, M.D., Mayo Clinic, Rochester, Minnesota opposing. Moderating is Aaron G. Rosenberg, M.D., Rush University Medical Center, Chicago, Illinois.



Current Concepts in Joint Replacement/RRY Photo Creation

Dr. Barrack: I'm going to espouse a point of view that these are of unproven value and I thought they would work, that's why I did 200-300 of them. I'll share my experience with you. Variability in component alignment is a major issue in total knee replacement. In the short-term such variability can lead to symptoms and long-term it can lead to failure. After a decade of clinical use, most of us have decided that navigation really doesn't have a major impact. It never really penetrated the American market more than 3-5%. In the last 5-6 years, Patient-Specific Instrumentation (PSI), where we're using MRI or CT to generate a model of every patient's lower limb to produce the patient's specific implants, have become available.

All of the existing devices use a neutral mechanical alignment with a zero degree hip-knee-ankle axis and the implants are perpendicular to the axis. Generally, parallel to the epicondylar axis. As these are the goals, it is important to ask these questions: Do these devices increase accuracy and minimize outliers? Do they increase efficiency and lower operative time and cost? Do they improve clinical outcome? We've done studies that we've published on all three of these issues: OR efficiency, radiographic accuracy, and patient satisfaction and function.

So we used an OR database to determine the total tourniquet time and total time in the room between cases with the PSI versus standard and every step in instrument processing was timed utilizing industrial efficiency methodology. These times were actually converted to the cost of the materials, personnel and a fixed overhead. Certainly there are fewer instruments and the OR crew liked it. The surgeons liked it. I liked it. We used four fewer instrument trays, but in a large center like ours, the actual savings to the hospital was surprising low—about $25 per case in wages and consumables. There was slightly lower OR time and turn-over time that translated into $300 of savings. So it's about $320 per case saved by the hospital. But if you looked at the total cost, the guide itself cost almost $1,000, the MRI cost about $1,000, so the cost to the system was $2,000. So the personnel liked it; the OR staff liked it, but if you can't prove a clinical benefit in this day and age, particularly with bundled payments, you're not going to be able to prove some cost savings unless there is a clinical advantage.

So we looked at radiographic results. We used the same CR knee—cruciate retaining knee—in all cases. We measured coronal alignment with CT "scout" methodology, which is very accurate, and we had a blinded observer measure all the x-rays. We looked at all the standard measurements of femorotibial angle, hip/knee/ankle axis and the zone of the mechanical axis. We found no difference in incidences of radiographic outliers. We achieved a target about 80% of the time with both methods. PSI really didn't help us avoid outliers.

What about the major issue? Does it improve patient satisfaction and function? In a recent publication, we reported on 200 patients, 100 of each instrumentation methodology, that were carefully examined pre-op and post-op with all patient reported outcome measurements. We found no clinical difference in PSI versus standard instrumentation. Patients did not perceive any improvement in their results.

So why do current generation PSI, with a neutral mechanical alignment target, not alter results? There are a number of potential reasons. There are a number of sources of error in PSI that may actually be more than standard instrumentation. Chris Peters from Utah found that he had to make adjustments 2-3 times per case. Secondly, we have data to show that the cut plans, when you take an image of a patient that's supine, non-weight bearing, with the hip and knee flexed, I don't believe they're accurate. And I think aiming for the same alignment and rotation is changing the axis of rotation in many patients.

We generated cut plans with weight-bearing images using EOS and found that the images obtained when you generate a plan with a weight-bearing patient and correct for rotation were dramatically different than the cut plans that were generated from an MRI with the patient supine and the hip and knee flexed.

Which is right? I would bet on the one with the patient weight-bearing and corrected for rotation.

In summary, we adopted PSI and used it in 200-300 cases hoping that it would improve the results of knee replacement, but it did not.

Dr. Pagnano: I'd like to review my approach to patient-specific instruments and look at CT-based solutions in that arena.

I think as surgeons we share some common goals in knee replacement. We want these knees to be reliable, durable and we want the operation to be safe as we seek to alleviate pain and improve function for our patients. There are many techniques that have been espoused over the past decade on how to get improvements. Computer-assisted surgery is something that Dr. Barrack and I would agree on. Computer-assisted surgery has no proven clinical benefits in knee replacement. Much of the initial enthusiasm for computer navigation has waned. It has proven to be cumbersome, time consuming, and expensive.

Patient-specific instrumentation was introduced with the idea that we might be able to harness some of the accuracy gains of computer navigation and

take advantage of marked advances in 3-dimensional reconstruction techniques. To Dr. Barrack's points, to date we haven't harnessed all of these advantages in the patient specific instrumentation, but it remains within the realm of what is possible. One of the benefits is you move the computer part out of the operating room. There is the opportunity to save operating room time, operating room resources, and I think, importantly, save some of the surgeon's mental energy to focus on soft tissue balancing at the time of surgery.

There are multiple vendors of PSI. There are multiple differences between the different types of instruments that are available. The alignment goals now are all based on the mechanical axis. Imaging modalities are CT, MR or MR+, hip/knee/ankle x-ray. You can use pin guides or integrated cutting guides. I think what's important also is the degree of surgeon input into the pre-op planning processes. My personal preference when I utilize PSI is to use CT imaging. I think you get the best data with that for a 3-dimensional model. You get more data, a higher level of detail, better resolution based on the image acquisition matrix of CT versus MRI. I want surgeon involvement in the pre-op planning throughout the whole process. I think the surgeon should be involved in all aspects of the planning process. Review, approve, change, redesign. If you don't do that, if you just rely on generic, average solution, you can expect generic, average results.

I want cutting guides, not just pin guides, and I prefer an integrated metal cutting slot to harness the accuracy of the cutting. The blocks can get multiple points of contact with the patient's bone, so why give up that good fit and just rely on two pins when it's time to make the cut. And if you cut through metal, not just plastic—there's a long track record of cutting through metal slots in orthopedic applications—I think you're going to get the best accuracy and it's going to be the most efficient way to accomplish that.

With the CT-based blocks, at least, the real world accuracy based off of the plan is pretty good. We can argue whether the plan that's generated is right, wrong or indifferent. The real world accuracy is quite reasonable. The carti-

lage mapping for the CT-based imaging is certainly very importantand there is proprietary segmentation software that is available from a couple of different manufacturers.

So who wins? I think that depends on where you stand in the healthcare system. The patient can win in certain circumstances because they can get reliable surgery with predictable outcomes. The surgeon can win because there is some time advantage. This time advantage is particularly pertinent to lower and middle volume surgeons in general hospital settings. The hospital can get increased productivity and decreased stress among their OR staff. For some of the payers at least they have been able to demonstrate reduced total care costs. Again, particularly when you're dealing with low and middle volume surgeons and hospitals.

In conclusion, I think PSI allows us to move the computer part out of the operating room, save operating room time and resources, save our mental energy during surgery to focus on soft tissue balancing.

Moderator Rosenberg: Robert, your main complaint about PSI is that it's not cost effective, and you see no difference in alignment or clinical status. If it were to be demonstrated to be cost effective, would you be more interested in using it on a regular basis?

Dr. Barrack: I used it. I didn't undertake a study hoping it wouldn't work. I wouldn't put 200 patients through that. I hoped it would work. It just doesn't. It has to be more than cost neutral because the time it takes for a patient to have a CT scan, for your office to schedule the scan, then for you to go online and manipulate the scan, is longer than it takes to do a total knee with standard instruments. And there's the radiation exposure of CT. Go to any radiology meeting, it's a huge issue…x-ray exposure of CT is all over their literature. So it has to be more than cost neutral. In the current environment, you have to prove improved outcome and patient satisfaction, otherwise how do you justify the additional time and expense of the CT scan and the work you do to read it?

Moderator Rosenberg: So at the end of the day, my sense of it is that it's a wash in many respects. The benefits and the risks of it sort of balance out and it accomplishes some of what Mark has said.

Dr. Pagnano: It's dependent on doing what Robert did which is using standard radiographic or EOS imaging for generating 3-dimensional models based off of plain x-rays. You lower the cost, lower the barrier to entry, and I think, then, it's a little more applicable widely.

Dr. Barrack: I think the million dollar question in knee surgery is whether we can improve overall clinical results and get rid of dissatisfied patients by individualizing how we align the components. If we saw their relative rotation of the tibia and femur and we customized the alignment and rotation of the components, then you use this technology . But to use this technology to align everybody the same, I don't think you're going to see a difference in clinical results.

Moderator Rosenberg: Gentlemen, thank you very much for your participation.

Please visit www.CCJR.com to register for the 2015 CCJR Winter Meeting, December 9 - 12 in Orlando, Florida.

New Spine Hospital More Like 5-Star Hotel // Clever Prep-Book Bolsters Orthopedic Exam Success // 12 Year Data Supports Lateralization of Reverse Shoulder Implants

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

It's a Spa, It's a 5 Star Hotel: No, It's The Spine Hospital! Their goal is to create a never-before-seen hospital experience for spine patients. Dan Riew, M.D., Larry Lenke, M.D., and Ron Lehman, M.D. said goodbye to friends and colleagues at Washington University in St. Louis this summer, and they are now hard at work in New York. Dr. Riew is the new Director of Cervical Spine Surgery at The Spine Hospital at the New York Presbyterian/Allen at Columbia University College of Physicians and Surgeons. Dr. Lenke functions as Surgeon-in-Chief and Director of Spinal Deformity. Dr. Lehman is Director of Lumbar Degenerative Surgery and Director of Spine Research. Dr. Riew tells *OTW*, "There is a real excitement in the air, with people contacting us from all over the globe to ask about joining us."

Courtesy of The Spine Hospital at the New York Presbyterian/Allen at Columbia University College of Physicians and Surgeons

And why the buzz? "Drs. Lenke, Lehman and I have a shared vision of what will give spine patients the best hospital experience possible. Our first goal is, of course, to provide world-class surgical and clinical care. But in addition, we provide concierge level service often reserved for elite hotels. At check-in, patients are given a 'Spine Hospital' robe and an amenities bag. One patient told me, 'I have had many operations, and I never want to have surgery anywhere else but here.' Another patient from the Middle East told me that she has been in hospitals all over the world and this is the 'best care she has ever experienced.'"

"In December, Drs. Mark Weidenbaum, Jay Kim and Charla Fischer will be joining us from the main campus. All of our patients will have critical care intensivists and/or hospitalists as part of the clinical team. We round with a PA, hospitalist, nurse, PT, OT, resident and/or fellow and, if necessary, respiratory therapists, dieticians, and social workers. Our nurse-to-patient ratio is either one on one or one on two. And when patients need telemetry or a step-down unit care they can actually remain in their rooms, as the equipment and nursing are all built-in. We have the first spinal robotic surgery apparatus in the greater New York metropolitan area, the latest radiology equipment able to perform low-dose X-rays of the entire spine and skeleton from skull to feet, intraoperative CT and navigation capability, 3D microscopes, and brand new state-of-the-art operating rooms with a surgical viewing area that is unparalleled. Every piece of equipment that is necessary to provide top-notch care, as well as provide for the ease and comfort of the patient is available."

"As for the operating room (OR), visiting surgeons don't even have to enter the OR to see the surgery. They can remain in a comfortable conference room and watch an HD television screen showing exactly what I see through the microscope. They can watch three different operations occurring in three different rooms. On my microscope, they can watch on a 3D monitor with 3D glasses to get a great perspective. We've already had visiting surgeons from Asia, Middle East and Latin America and have many others signed up over the next three years."

Further clarifying the emphasis on detailed patient care, Dr. Riew notes, "I had a patient whose wife called me at 6pm on a Friday. She said that the

room temperature had been increasing for the last hour and was 75; she wanted it to be 72. I called the floor administrator and someone was there to repair it immediately—on a Friday evening! You would never see anything like this happening at the typical urban medical center. Because we are a small and specialized hospital, we can control everything from the temperature to how everyone interacts with the patient."

"Over the next year we hope to have the Columbia University neurosurgeons join us, add more nonoperative staff, as well as more patient rooms and ORs. We have three fellows for our inaugural Comprehensive Orthopedic & Neurosurgery Columbia Spine Fellowship for 2016-17 and are excited that we were able to match our top three choices with phenomenal fellows."

Ace the Exams With an Unusual New Tool Need an unusually concise, precise, book to prepare for board/recertification exams or the Orthopedic In-Training Examination? Now there is a tool that goes beyond the basics and provides challenging answers to tough clinical situations. *Acing the Orthopedic Board Exam: The Ultimate Crunch-Time Resource*, a new vignette-based prep book, was edited by Brett R. Levine, M.D., M.S., an Associate Professor of Orthopaedics in the Adult Reconstruction Division at Rush University Medical Center. Dr. Levine tells *OTW*, "What sets this book apart is that it is based on vignettes, and is written in a colloquial—even funny—style. You can tackle it in a weekend and retain high yield information."

"There is an extensive list of co-authors, most of whom are recent graduates of residencies or who are senior residents. We attempted to get into the mind of the question writer. We want the reader to be able to pick up key words and phrases that he or she can look for on an exam. You don't always know the answer, but if you know what the question writer was thinking then you can get yourself to the point where you've narrowed it down to a couple of options on a multiple choice question. At that point you can use your knowledge to determine the correct answer."

"While it was challenging to achieve a good, representative mix of vignettes, we were able to do so. There are several multidisciplinary vignettes. For example, we took a lot of joint replacement vignettes and turned them into not just questions on osteoarthritis and simple joint arthroplasty, but things like 'Patients have had questions about recalls. How do you explain the sci-

ence behind these problems?' There are vignettes about the basic science of metals (which the modern day patients tend to ask frequently). In general for testing purposes it is hard to tell what next will be added to the boards; however, you are safe with new technology, if it has been out for two years and has had enough publications, then it is fair game to be on the exam."

This new book is focused on giving students an edge on the really tough questions, says Dr. Levine. "We didn't want it to be a simple review of the basics. This book goes way beyond that, and can even help you make a good impression while on clerkship rounds. Let's say you are on the pediatric orthopedic service. You can arrive at the hospital early, grab a cup of coffee, and quickly zip through the high yield questions and pick up 15-20 new facts. Then you go do rounds and you stand out as someone who is ahead of the game."

Lateralized Reverse Shoulder Implants: NOT Disastrous He gives credit where credit is due. But as accomplished researchers do, Mark A. Frankle, M.D. knew that improvements were possible. Dr. Frankle is an orthopedic surgeon with Florida Orthopaedic Institute in Tampa and director of the Biomechanical Shoulder and Elbow Research Lab at the University of South Florida College of Engineering. He tells *OTW*, "As reverse shoulder replacement grows in popularity, improving our understanding on how to improve outcomes and reduce complications will be of increasing importance. The surgery was originally popularized by the French surgeon Paul Grammont, whose device was critical in providing evidence of efficacy of a reverse shoulder replacement. However, associated with the improvements in outcomes were scapular notching, loss of rational strength and alteration of the deltoid contour. Based on my examination of his device, I lateralized the center of rotation, something that was criticized by most shoulder surgeons. They thought it was headed for disaster."

"My colleague, Mark Mighell M.D., is fluent in French, so he read all of the original papers on Grammont's device. This then led to the first lateralized reverse shoulder replacement in the United States; it became the Encore Shoulder Reverse Shoulder Prosthesis (owned by DonJoy). The purpose of our most recent study was to evaluate all of the reverse shoulder prostheses that I did from 2000 to 2012. We examined how many reverse patients had to undergo reoperation for component issues. (If another surgeon did the reoperation then we didn't have data on that.) Of the 1,418 reverse shoulder surgeries that I did in 12 years, 85 required reoperation. We wanted to know why."

"During that 12 year period there were design changes…we wondered if those impacted the reason for reoperation. The reasons for reoperation fell into seven categories:

1) loosening or breakage of the glenoid base plate attachment
2) dissociation of the base plate where the glenosphere attaches
3) dissociation of the humeral component (during this time there was a cup attached to the stem)
4) dislocation of the glenohumeral joint
5) loosening of the humeral component
6) fractures around the implant that required an exchange of implant
7) infection that required component exchange or removal."

"From January 2000-2004 the way the baseplate attaches to the bone involved a central screw and a peripheral screw that were nonlocking (3.5mm in diameter). This was the biggest reason for reoperation; of 242, 31 had to undergo reoperation because of that design. In 2004 the peripheral screw was changed to a locking screw (now 5mm). From 2004-2014 only 4 out of 1,176 patients were revised for that reason, a significant reduction."

"Overall, there were three design changes made in 12 years. One alteration was a change in the peripheral screws on the base plate. That resulted in a decrease in reoperations, something that correlated with the biomechanical studies at the time."

"There is ample evidence—not just from my data and biomechanical data—but from other surgeons showing that you can lateralize and not have high likelihood of failure. In Grammont's design the ball was a hemisphere, so there was only so much distance you can push the socket from the shoulder blade. When the ball was made into an elliptical shape (such that it is farther away from the scapula) the likelihood of the socket on the humerus hitting the shoulder blade was far less. With the Grammont design notching was a real problem. The radiographic evidence showed that there was abrasion of the polyethylene that generates a lot of wear, something that led to concerns about durability. That prompted me to push the socket away from the shoulder blade and thus make a lateralized sphere."

"Other manufacturers are incorporating lateralization into their reverse designs. Just two weeks ago I attended an instructional course on lateralization in reverse shoulder replacement; the consensus amongst the audience was that lateralization is an important principle." ♦

COMPANY

DePuy Synthes' Third Quarter Needs a Band-Aid

DePuy Synthes' third quarter revenue of $2.181 billion declined 0.7% from last year's third quarter. If you include the negative 7% impact of a strong dollar, reported revenue declined by a whopping 7%.

Knees did okay in the U.S., rising 2% due to strong sales of the Attune knee system. Worldwide, knee sales were flat. In hips, revenue climbed 3% in the U.S., driven by the company's primary stem platform and sales worldwide, rose 2%. Overall, trauma was flat, but climbed 5% in the U.S. due to new products.

Pruden Explains

Gary Pruden, Johnson & Johnson's new Worldwide Chairman Medical Devices (and parent of DePuy Synthes) said the company has seen mixed results in trauma's performance. "This has been an important area of focus since acquisition. However we have seen a lower level of innovation though due to a number of factors including the significant remediation effort to bring some of these up to Johnson & Johnson quality standards and the overall integration efforts during the last few years."

Going forward, he said the company will focus resources to deliver "new innovative products and target faster growing categories within the market such as elective foot and ankle. The recent success of our new Femoral Nail System TFN Advanced demonstrates receptivity in this category to new and meaningful innovation."

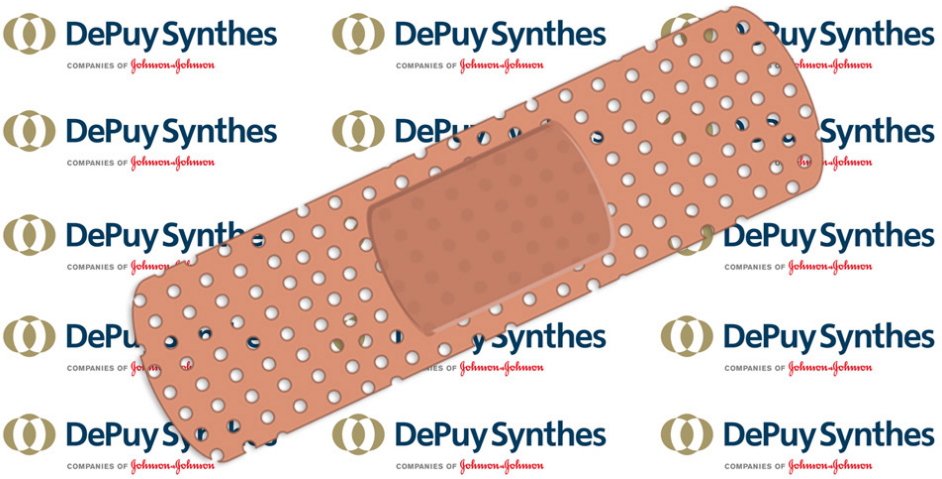


Photo creation by RRY Publicaitons, LLC / Courtesy of DePuy Synthes

DePuySynthes 3Q2015	Sales ($ in millions)	% Change
Total Reported Sales*	**2,181**	**-7.0%**
Knees		-5.0%
Hips		-5%
Spine		-12%
Trauma		-7%

Source: Johnson & Johnson
** Currency impact -7%*

Dismal Spine

Spine was dismal, dropping 6% worldwide, but staying flat in the U.S. The company attributed the weak spine results to "competitive challenges." BMO Capital Market analyst Joanne Wuensch said it appears that continued JNJ/Synthes integration may benefit some of the smaller spine market competitors.

Company officials told analysts on October 13, 2015 that sales contributors to the U.S. growth were strong double-digit sales of Orthovisc and Monovisc.

Weakened China

The results outside the U.S. were negatively impacted by softer demand and a reduction in inventory levels, primarily in China, said the company.

In orthopedics, Pruden said the company is prioritizing its knees and trauma platforms. He expects the knee market to grow at 3.8% CAGR to around $9 billion over the next six years.

"We believe we're well placed for growth with products and instruments from our Attune platform," said Pruden.

Betting on Scale

Sounding a little like recent comments from Medtronic plc to leverage a large scale of products and services to health systems, Pruden said the company was "implementing cross portfolio procedural development like the new OsteoView device, which leverages the harmonic technology from Ethicon to provide a soft tissue dissector, exclusively designed for spine procedures and to be sold by the DePuy Spine business."

As an example, he cited a new relationship established with one of Germany's

largest private hospital networks where the company has a sole source contract for implants. "Here in the U.S., we signed a five-year contract with the globally ranked academic medical center at Johns Hopkins. We're also executing an exclusive partnership with a large multinational hospital system to share risk and great value."

Pocket Full of Cash

The company sounds like it's shopping around. At the end of the quarter the company had approximately $17 billion of net cash, which consist of approximately $37 billion of cash and marketable securities and approximately $20 billion of debt.

"This is a higher level of cash than we typically hold and we are actively looking for the right opportunities to use that capital to create greater value for our shareholders," said company officials.

Spine players not named Medtronic, Stryker or Zimmer Biomet must be listening. — *WE*

HSS Orthopaedic Residency Top Ranked By Doximity (2nd Year in a Row)

Hospital for Special Surgery (HSS) is pleased to announce that for the second consecutive year, its orthopaedic residency program has been top ranked by Doximity.

"We are honored that our residency program has been recognized once again by Doximity," said Mathias Bostrom, M.D., orthopedic surgeon and residency program director at HSS, in the September 30, 2015 news release. "We strive to immerse our residents in the best educational, clinical and research activities possible so as to train the next generation of orthopaedic leaders. We are pleased that our efforts are resonating with the residents and those outside the program."

According to the news release, "Nearly 4,000 residency training programs were evaluated for the national rankings. The results are used in Doximity's free interactive tool, Residency Navigator, which is designed for third- and fourth-year medical students. When breaking down the rankings by data points, HSS was ranked first in both reputation and research output. Additionally, HSS received 5 out of 5 stars in overall satisfaction based on alumni surveyed."

According to the Doximity website, "Doximity's comprehensive database of physician CVs was used to determine which programs produce the most published alumni. Doximity's residency reputation listings reflects the opinions of more than 95,000 peer nominations from board certified U.S. physicians. The honor indicates which residency programs physicians hold in the highest regard for quality of clinical training."

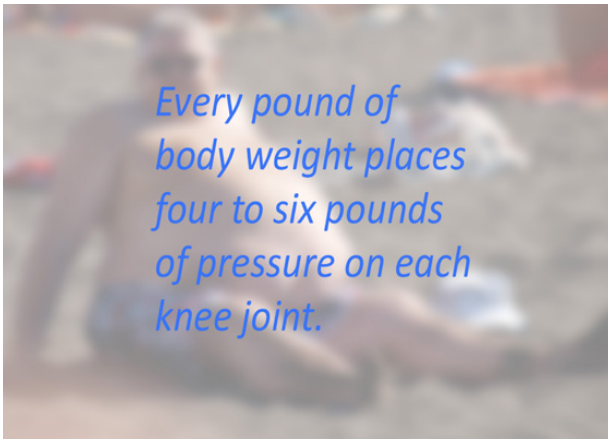
Dr. Bostrom told *OTW*, "It is truly an honor to receive this distinction from Doximity. It certainly didn't happen overnight; this ranking is a culmination of the work of an incredible team of support staff here at HSS. We have a very dedicated group of residents and trainees here, all of whom are amazing individuals who will go on to do great things."

Asked what in particular makes the HSS residents feel appreciated and feel like they are getting the best training, Dr. Bostrom replied, "All physicians and educators involved in HSS' Orthopaedic Residency program are always striving to do even better and to provide our residents with the best training possible. It is ultimately about improving patient care—better trained residents lead to better patient care." — *EH*

Hospital for Special Surgery

Obesity Summit and AAOS

The American Academy of Orthopaedic Surgeons (AAOS), the American Society for Metabolic and Bariatric Surgery (ASMBS) and 33 other medical societies, held the Second Annual Obesity Summit in Chicago in September.



American Academy of Orthopaedic Surgeons

The group met to identify opportunities for collaboration in treating obesity.

"We represent many different specialties, backgrounds and perspectives, but we're all really treating the same disease," said ASMBS President John Morton, M.D., MPH. "That's why there is intense and growing interest in how we can work together to better help our patients with obesity and related diseases. Obesity is the medical equivalent of economic inflation—obesity increases costs and decreases the effectiveness of medical interventions. We are paying for obesity already. Let's coordinate and provide care the right way."

The American Medical Association has classified obesity as a disease.

Orthopedics and Obesity

AAOS says it recognizes that obesity is not a choice, "but rather a complex, multifactorial process that affects a large number of patients and in most cases contributes negatively to their musculoskeletal problems. Our approach to these patients should encompass aid in the medical management of the issues associated with their obesity, as well as the potential surgical care that can help with both their general health as well as specific musculoskeletal problems. Likewise, it is equally important to assure the safety of healthcare facilities address-

ing those situations specific to the obese patient."

AAOS Educational Tool

AAOS has issued an Information Statement about obesity and musculoskeletal care and developed an educational tool. Click here to read the statement: http://www.aaos.org/about/papers/advistmt/1040.asp

According to the statement, obesity negatively affects orthopedic management of nearly all musculoskeletal disease processes. Numerous orthopedic studies have concluded that the burden of obesity is significant on a variety of outcome measures including infection risk, non-union, persistent pain, cost, and implant failure.

In citing one of many examples, the statement notes that obesity has a direct result on the development of osteoarthritis of the hip and knee joints. In the knee, the Canadian Joint Registry data reported that the need for having a total knee arthroplasty was 8.5 times greater for individuals with a BMI > 30, 18.7 times more likely for those with a BMI > 35, and 32.7 times more likely in patients with BMI > 40 compared to individuals of normal weight.

The statement also addresses issues related to total joint arthroplasty, pediatrics, spine, shoulder and elbow, hand, foot and ankle, sports and arthroscopy, malignancies, trauma, advanced imaging and office-based/care setting concerns.

There's another excellent article titled: "Obesity linked to increased risk for orthopaedic conditions and surgical complications" on the AAOS website: http://newsroom.aaos.org/media-resources/Press-releases/obesity-link-to-increased-risk-for-orthopaedic-conditions-and-surgical-complications.htm. — *WE*

K2M Launches Everest at SRS's 50th Annual Meeting

K2M Group Holdings, Inc. launched its Everest deformity spinal system at the Scoliosis Research Society's (SRS) 50th Annual Meeting in Minneapolis the last week of September. It was the company's fourth product introduction in its complex spine portfolio in the past year.

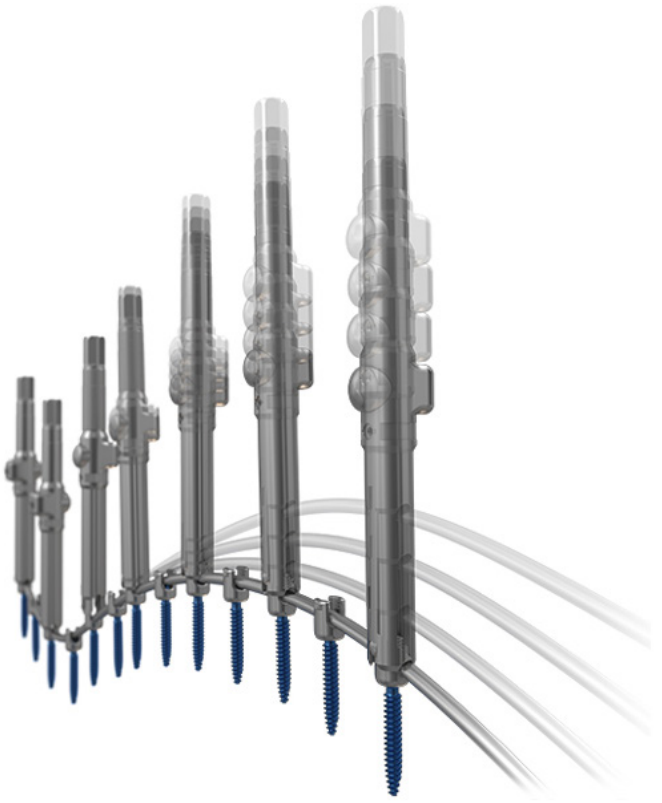
According to the company, the system allows for faster insertion and increased pullout strength. It also removes the need for reduction screws, offers segmental reduction of the rod, and provides intraoperative flexibility.

Featured in the system is a top-loading pedicle screw with a variety of screw types and accommodates titanium and cobalt chrome rods in two different diameters. The Basecamp Deformity Rod Reducer instrumentation provides surgeons with multiple options during surgery in one system with 60mm of quick or controlled rod reduction.

Shay Bess, M.D., chief of adult spinal deformity in the department of orthopedic surgery at the NYU Langone Medical Center's Hospital for Joint Disease in New York, said the system "offers a streamlined and comprehensive approach and adapts to each surgeon's preferred surgical technique, thereby allowing me to make the appropriate surgical decisions for my adolescent and adult patients."

He specifically noted choices in rod diameter, rod material, construct configuration, and deformity correction techniques.

The system includes polyaxial and uniplanar screws, which feature a dual-lead thread pattern for faster insertion and increased pullout strength. The set screw features a modified square thread design that facilitates set screw introduction. The mixed-metal tulip minimized head splay and, according to the company, demonstrated improved biomechanical performance when tested against an all-titanium alloy screw.



Everest Deformity Spinal System/K2M Group Holdings, Inc.

Frank Schwab, M.D., spine service chief at the Hospital for Special Surgery in New York, said the speed and control Basecamp provides exceeds his expectations and gives him the ability to reduce the rod and correct the spine in a controlled fashion."

Eric Major, the company's president and CEO, said that along with Everest, the company has introduced the MESA 2 deformity spinal system, K2M's flagship product for adolescent idiopathic scoliosis, the Nile alternative fixation spinal system, a low-profile band fixation technology, and the Capri corpectomy cage system, a trauma- and tumor-focused system offering new, unique intraoperative functionality.

Major said, "2015 has been a year of complex spine innovation for K2M." — *WE*

LARGE JOINTS

Operation Walk Is Off to Cuba

After an 11-year absence it is back to Cuba for Operation Walk, a Los Angelss based nonprofit that provides hip sand knee replacements in developing countries. For 20 years, Operation Walk provided total hip and knee replacement surgeries for free. Since 2004, politics made it impossible for the charitable organization to help Cubans.

Now, according to Paul Guzzo of the *Tampa Tribune*, with the recent thaw in relations between the U.S. and Cuba a team of 70 U.S. medical professions will go to the island nation in

Wikimedia Commons and QYD

November with the goal of performing as many as 50 surgeries. They will be led by surgeon Kenneth A. Gustke, M.D., a founding member of the Florida Orthopaedic Institute.

Gustke was part of Operation Walk's last mission to Cuba in 2004 and looked forward to future trips there. But, as Guzzo wrote, the following year, the State Department denied the nonprofit's request to visit the island nation. Said Operation Walk's medical director Jeri Ward. "Every year we'd ask again and be turned down. We are happy we are going back. We are just people who want to help other people."

Gustke, who has volunteered with Operation Walk since the early 2000s, said, "Some of these patients will not have arthritis like we see in the U.S. Due to lack of treatment for so many years, some have grossly deformed limbs and can barely get around even with a walker."

All members of the U.S. team—the surgeons, nurses, physical therapists, anesthesiologists and every other medical professional needed to treat the patients from check-in to check-out are volunteers, according to Guzzo.

It is Operation Walk's practice to take over an entire ward in hospitals that it visits. In the case of this visit to Cuba the organization will establish itself in the Centro de Investigaciones Médico Quirúrgicas (CIMEQ Hospital)in Havana.

"The amount of gratitude you get from people who would otherwise have zero access to this help is amazing," said Gustke. — *EH*

Study Supports Vitamin D to Reduce Fracture Risk

Let's hear it for vitamin D. A small but significant study in Sao Paulo, Brazil, found that taking 1,000 IU of vitamin D 3 times per day over 9 months strengthened muscle mass in postmenopausal women who were at risk of falling, according to Parker Brown, staff writer for *MedPage Today.*

Researchers in Sao Paulo performed a randomized trial and found that supplementation was associated with a significant increase in muscle strength (+23%) in the chair raising test ($P<0.036$) compared with placebo, and those on placebo faced a 1.9 times higher risk of falling (95% CI 1.23-3.08) and 2.8 times higher risk of recurrent falling (95% CI 1.43-5.50) than did those in the vitamin D group.

Brown reported that, "…those in the placebo group had more loss of muscle mass (-6.8%) than those in the vitamin D group ($P=0.030$) as measured by total-body DXA (dual energy X-ray absorptiometry). And vitamin 25 (OH) D levels increased from 15.0 ng/ml (±7.5) to 27.5 ng/ml (±10.4) in the supplementation group (n=80) and decreased from 16.9 to 13.8 ng/ml in the placebo group (n=80; $P<0.001$), according to the researchers, who were led by Dr. L.M. Cangussu, at the Botucatu Medical School at Sao Paulo State University."

The participants in the study were Brazilians between the ages of 50 to 65. All had a history of falls. The mean age of the patients was 58.8 in the vitamin D group and 59.3 in the placebo group.

"While this study is unlikely to decide the debate over vitamin D, it provides further evidence to support the use of vitamin D supplements by postmenopausal women in an effort to reduce frailty and an increased risk of falling," said Wulf Utian, M.D., Ph.D., DSc(Med), the executive director of the North American Menopause Society. — *BY*

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EXTREMITIES

AAOS Taking on Opioid Epidemic

The American Academy of Orthopaedic Surgeons (AAOS) Board of Directors is confronting the problem of opioid abuse, with a new information statement outlining ways to improve physician, caregiver and patient education and track opioid prescription use, among other things.

"While minimizing patient discomfort remains an important goal of orthopaedic care, great caution should be used in prescribing opioids," said David Ring, M.D., Ph.D., a member of the AAOS Patient Safety Committee. "The new 'AAOS Information Statement on Opioid Use, Misuse and Abuse in Orthopaedic Practice' outlines specific strategies, considerations and collaborations for advancing safer and more effective pain management."

"A culture change has created the current opioid epidemic, and only a culture change—led by physicians unafraid to limit opioid prescriptions—will solve the epidemic," said Dr. Ring.

Photo creation by RRY Publications and Wikimedia Commons

Asked about stumbling blocks for orthopedic surgeons when it comes to discussing this issue with their patients, Dr. Ring told *OTW*, "Patients and surgeons tend to expect pain relief to come from pills. Both may be surprised when strong opioids don't relieve pain as well as hoped. Most people know someone who has gotten hooked on opioids and many of us know someone who has died. The current opioid crisis makes it easy to discuss the limited role that opioids should play in pain relief. Just planning for pain management can make a huge difference in post-operative pain intensity. Surgery hurts. Pain after surgery, while expected, can feel like something's wrong. When it feels like something is wrong, pain is amplified. Planning for these feelings, and devising a strategy for how to address pain with acetaminophen, non-steroidal anti-inflammatory drugs, ice, elevation, and splinting can go a long

way. Being available to address patient concerns and empathize with their discomfort and unease is soothing. It can help to call patients the day after outpatient surgery. It can be difficult to say the right thing when someone is in pain. Surgeons are goal-oriented. We are technically oriented. And we aren't always great communicators. Effective communication skills and empathy are key. Surgeons should script and practice their words for difficult situations. We should train ourselves to be more empathetic. Patients want to know that we take interest in them and care about them."

"The nation is working hard on all fronts to correct the mistakes we made with opioids. No one argues the role of opioids in end of life care. But scientific evidence has established the limited benefit of opioids for both acute and persistent pain, and the substantial risks and real harms. The next step is to change the culture. We fear pain, but we should fear opioids equally and handle them with great respect and care. The evidence that our efforts are making a difference is in the statistics that show a decline in prescription opioid sales and the corresponding decline in opioid related deaths. We can prevent new addictions, but we need to take care of the people that are already hooked, many of whom are turning to heroin. I know we are making a difference when I partner with my patients to use as few opioids as possible and to put any leftover opioids in appropriate disposal units in police stations and some health care facilities. People are aware of the problem and they want to help. I wish our national pharmacies would place these units in every store."

Read the full information statement here: http://www.aaos.org/about/papers/advistmt/1045.asp — *EH*

Only the Brave… AOFAS Course Like No Other

A unique foot and ankle course is about to take the stage in Tampa, Florida. The biennial American Orthopedic Foot and Ankle Society's (AOFAS) Surgical Complications Course attracts foot and ankle specialists from the interested to the experienced. The uniqueness of this course lies in its academic premise: Each lecture is limited to a discussion on the complications of a procedure or condition, followed by the methods to achieve a successful resolution. This course is not a technical review of the procedure itself, it is solely a candid discussion on complications, which are rarely analyzed to this degree in the world of orthopedics.

The key to putting on such a challenging course is the makeup of the faculty. Each faculty member must reveal in depth what surgeons traditionally don't openly discuss: their own complications. Not many faculty would accept this "generous offer." However, when Steven L. Haddad, M.D., immediate past president of the AOFAS calls, most surgeons do give him a listen. Dr. Haddad, who is chairing the event this year, tells *OTW*, "I started this course in 2007 because I wanted something unique where we would not just review basic or advanced procedures; those courses are more common. My goal was to create a safe environment where surgeons could openly discuss their complications and how they dealt with them. The key is honesty, and without it, the complication becomes nothing more than a disappointing outcome for the patient. Rather, I wanted to turn this unfortunate experience into an opportunity to learn, so that both surgeons and patients might benefit."

The next AOFAS Surgical Complications Course—or "bearing of the soul" as Dr. Haddad calls it—will take place November 5-7, 2015 in Tampa, Florida. Dr. Haddad: "I have assembled a faculty of seven highly trained and well-respected foot and ankle surgeons… individuals who are known to be honest about managing complications. The audience recognizes that these surgeons are highly skilled, and have a wealth of experience, and thus they have the ability to manage unsolicited outcomes with poise and persistence."

Subject material covers the gamut of foot and ankle pathology, including individual procedures of the forefoot, midfoot, hindfoot, and ankle. "Unique to this year is an in-depth analysis of total ankle arthroplasty complications,

as well as state-of-the-art discussions on 'making nonunion a thing of the past' and 'assessing alignment: how to avoid imbalance in the first place.' We will cover the critical topics of avoiding incision complications, managing infection, and limiting symptomatic nerve damage. Finally, the audience will have a dedicated session to present their own complications to the combined faculty, achieving the ultimate second opinion in the appropriate forum. Upon conclusion, the participant will have a thorough understanding of the world of foot and ankle complications, and how to successfully treat them. This is one course not to miss!"

For more information on the AOFAS Surgical Complications Course, please visit: http://www.aofas.org/education/SurgicalCX/Pages/SurgicalCX.aspx — *EH*

Providence Medical Introduces Cavux Surface Technology

Providence Medical Technology, Inc. has just introduced its Cavux surface technology, an innovation meant to speed bone fusion during the healing process. According to the company's October 13, 2015 news release the company's portfolio of DTRAX Cervical Cage implants will be available with Cavux, a unique surface technology that produces micro-textures on titanium surfaces. The micro- and nano-textures created across the implant surface area serve to enhance the fusion process.

"Surfacing technologies have delivered positive clinical results in orthopaedic and dental surgery to-date. Cavux surface technology was developed based on these successful principles, and we believe it has the potential to enhance cervical spine fusion when applied to our DTRAX product portfolio," said Providence Chief Executive Officer Jeff Smith. "The addition of this exciting technology represents an important step towards our goal of becoming the most innovative company in cervical fusion."

Asked about the most interesting part of the development phase, Ed Liou, vice president of Engineering and Operations, told *OTW,* "Providence favors titanium for its strength, workability, biocompatibility and favorable osseointegration properties. During the development of Cavux it was exciting to find new ways of treating the surface to gain even more favorable tissue-implant interactions. Cavux technology encourages further improved osseointegration rates over an already superb implant material."

Regarding inquiries they might receive at this week's meeting of North American Spine Society, Liou commented, "We expect that if we receive questions, they will likely probe to understand the *features* of the surface technology, rather than the *whys*. The benefits of surfacing technologies on established implant materials like titanium are relatively well understood within the industry. And there does appear to be a movement to return to the known, positive, long-term clinical outcomes of titanium as an implant material."

"Our Cavux surfacing technology uses a subtractive process, rather than adding something to the external surface of the device. I think people will immediately recognize that this means no new biocompatibility or flaking concerns common to additive or sprayed-on surface treatments. The Cavux surface has been designed with macro features to aide in implant retention, along with micro- and nano-level features that focus more on protein and cell adhesion to gain quicker healing and fusion." — *EH*

Providence Medical Technology, Inc.

Like Pulling a Sword From a Stone

Medical practices continue to face new and novel challenges. To provide assistance and an infusion of new ideas, the American Medical Association (AMA) and the Medical Group Management Association (MGMA) joined together to sponsor a competition of ideas for medical practice improvement. The competition is called the Practice Innovation Challenge.

At its meeting in Nashville, the AMA and MGMA announced the five winners whose proposals offer "the best innovative strategies that will help physicians and their staffs thrive in the new health care environment."

Judges found the five below demonstrated the most high-value, easy-to-adopt solutions that can help improve efficiency in a medical practice and enhance patient care. The winners each received an award of $10,000. In addition the practice will have the opportunity to develop an educational module with the AMA & MGMA to be shared with practices across the country.

The winners are:

1. **Asante Physician Partners, Medford, Oregon**
   Patient-Centered New Patient Process
   A streamlined patient registration process that provides complete and accurate information on new patients while substantially cutting administrative costs.
2. **Center for Excellence in Primary Care at the University of California, San Francisco**
   Health Coaching
   A proactive model for engaging with patients in collaborative health action plans that saves physicians time while enhancing patient outcomes and satisfaction.

Wikimedia Commons and Moyan Brenn

3. **Stanford University, Stanford, California**
   The Letter Project
   A catalyst for overcoming language barriers with patients and providing accessible written information in numerous languages that can facilitate end-of-life planning discussions with a physician.
4. **University of Tennessee Health Science Center, Memphis, Tennessee**
   Building a Medical Home-Based Care Transition Team
   A team approach to preventable drug therapy problems that decreased hospital readmissions in targeted patients.
5. **Vanguard Medical Group, Montclair, New Jersey**
   Medical Assistant In-Service Education
   An interactive education curriculum that improves the performance of medical assistants as important members of the team-based care model.

President and CEO of MGMA Halee Fischer-Wright, M.D., said, "It's a testament to what's possible when medical practices get recognized for being stronger, more aligned and competitive in an ever-changing health care landscape." — *BY*

PEOPLE

In Memoriam: Christoph Röder, M.D., Ph.D., M.P.H.

The spine world has lost some of its brilliance. Christoph Röder, M.D., Ph.D., M.P.H., director of the Institute for Evaluative Research in Medicine at the University of Bern in Switzerland and a senior researcher in Spine Tango, has passed away at the age of 44.

Dr. Röder is survived by his mother, Christel Röder, and brothers, Tobias and Michael Röder. The funeral took place September 2, 2015 in his hometown of Limburg, Germany.

Christoph Röder, M.D., Ph.D., M.P.H., courtesy of EUROSPINE

For 13 years, Christoph Röder tirelessly led Spine Tango in an effort to ensure that reliable, comprehensive, and practice-changing data would be available to enhance spine care. Dr. Röder also spent time at the New York University Hospital for Joint Diseases, where he was a senior research fellow. Later, he was on the faculty at the University of Bern in Switzerland and then became the interim director and later the director of the Institute for Evaluative Research in Medicine at that facility. Regarding Spine Tango, Dr. Röder was

quoted as saying, "In the discussion about the rationale for spine registries, two basic questions have to be answered. The first one deals with the value of orthopaedic registries per se, considering them as observational studies and comparing the evidence they generate with that of randomized controlled trials. The second question asks if the need for registries in spine surgery is similar to that in the arthroplasty sector. The widely held view that randomized controlled trials are the 'gold standard' for evaluation and that observational methods have little or no value ignores the limitations of randomised trials. They may prove unnecessary, inappropriate, impossible, or inadequate. In addition, the external validity and hence the ability to make generalisations about the results of randomised trials is often low. Therefore, the false conflict between those who advocate randomised trials in all situations and those who believe observational data provide sufficient evidence needs to be replaced with mutual recognition of their complementary roles. The fact that many surgical techniques or technologies were introduced into the field of spine surgery without randomised trials or prospective cohort comparisons makes obvious an even increased need for spine registries compared to joint arthroplasty. An essential methodological prerequisite for a registry is a common terminology for reporting results and a sophisticated technology that networks all participants so that one central data pool is created and accessed."

Zoher Ghogawala M.D. is chairman of the Department of Neurosurgery at Tufts University School of Medicine. He worked with Dr. Röder on many occasions. He stated, "Chris Röder was a pioneer and champion of spinal registries. He passionately built the Spine Tango platform and shared his experience freely with others. He was ahead of his time and believed that global registries would ultimately improve spinal care. We are all benefitting from his leadership in the arena."

Emin Aghayev, M.D., a research associate and the Institute for Evaluative Research in Medicine at the University of Bern in Switzerland, knew Dr. Röder well. He said, "On one hand, he was an extremely dedicated, enthusiastic and motivated chief and colleague with a strong grip for any reasonable task, project and development. On the other hand, he was absolutely simple, down-to-earth, sensible guy, who almost always had time for his co-workers."

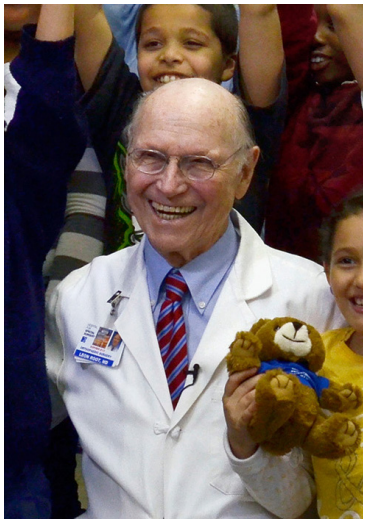
"He made outcome research and development of medical registries his aim in life. One of his major projects was the international Spine Tango registry that has grown to over 85,000 surgery forms and 220,000 patient-based COMI forms from over 50 spine centers in 17 European and Non-European countries, and that has published about 45 peer-reviewed articles. One important point is that he dedicated his life to promoting registries in such medical domains as spine, where randomized controlled trials are very often not feasible."

Eric Muehlbauer, executive director of the North American Spine Society, stated, "Chris was a good friend of mine and was a real joy to be around. He was a big fan of basketball player 'Dr. J' (Julius Erving) from the Philadelphia 76ers circa 1980. I gave him a Dr. J poster a long time ago that he loved. Since he was the director of Spine Tango, I would Call him 'Dr. T,' and always ask him, 'How goes the Tango?' I last saw him in Germany last December at the German Spine Society meeting."

"I would see him almost anytime I was in Europe and we would get together anytime he was here. He knew my wife and daughter too. Personally, I am heartbroken by his passing." — *EH*

In Memoriam: Leon Root, M.D.

For 47 years, when nervous children and families awaited their appointments at Hospital for Special Surgery (HSS), their fears were eased when a warm-hearted doctor named Leon Root reached out to greet them. Dr. Root, the talented and pioneering chief of pediatric orthopedics for 27 years, passed away on September 21, 2015. He was 87.



Leon Root, M.D., courtesy Brad Hess Photography

Dr. Root is survived by his wife Paula, his son, Matthew, his daughter, Lili, a brother, Benjamin, and four grandchildren.

Services were held on September 24, 2015 at Temple Emanu-El in New York City.

Only three years after joining HSS in 1968, Dr. Root established New York City's first clinic for children with osteogenesis imperfecta (OI), a congenital bone disorder characterized by brittle bones that are prone to fracture. People with OI are born with defective connective tissue, or without the ability to produce the tissue, usually because of a deficiency of type I collagen.

When Dr. Root recognized how difficult it was for many of the city's children to come to him, he went to them, establishing the state's first Pediatric Orthopedic Outreach Program (POP). Because of Dr. Root's efforts, more than 26,000 children have been screened in New York schools; 4,000 of those children were referred for further medical care.

Lou Shapiro, CEO of HSS, told *OTW*, "My memorable moment of Dr. Root was actually captured in a beautiful photo of Dr. Root surrounded by smiling children from a school in the Bronx in New York. Dr. Root and a team of residents, fellows, nurses and members of our Education staff had just conducted the HSS POP school screening. The moment and photo speak volumes about Dr. Root. He was truly an outstanding person and physician that embodied the overall mission of HSS—to serve and care for the community. It is who he was and how he lived."

Dr. Root was also one of the leading pediatric physicians who devoted a significant part of their practice, leadership and research to improving the lives of patients with cerebral palsy. He expanded the HSS Cerebral Palsy Clinic and served as president of the American Academy for Cerebral Palsy and Developmental Medicine.

On the research front, Dr. Root helped found a rehabilitation department in order to collect and analyze data on how patients move; the department is now known as the Leon Root Motion Analysis Laboratory.

Asked what he thinks Dr. Root would like to be remembered for, Shapiro noted, "Dr. Root has been a member of the HSS family for 47 years and a wonderful role model for all of us. He would often reminisce about how there were only eight orthopedic surgeons at HSS in 1980; today we have more than 100. But even though the hospital has grown in size, in staff and in scope, he loved that fact that we remain a close-knit community committed to the total well-being of our patients and their families. He will be remembered as one of the nation's foremost specialists in pediatric orthopedics and his legacy is his selfless care and tireless efforts to address the needs of the city's underserved children."

Dr. Cathleen Raggio, a pediatric orthopedic surgeon at HSS, remembers Dr. Root with great fondness, noting, "Dr. Root is the reason I went into orthopedic surgery 30 years ago. I met him when I was a third-year medical student. When I told him I had already decided to do a pediatrics internship but now wanted to go into orthopedics and would have to do two internships, I said I hope that that's not going to be a problem. He said, 'That's not a problem—this is great news! You're going to do well. So what, you have to do two internships. It'll be fine.' That's typical of Dr. Root—he turned everything into a positive and really encouraged you to do your best."

Asked about his best intellectual gift, Dr. Raggio told *OTW*, "Dr. Root was very inquisitive. He would ask questions and always listened to the answers. That's a very important quality. He not only asked "why" but he listened to what other people might suggest. Then he would follow through, think about it and research it."

"The orthopedic community knows that Dr. Root really embodied what it meant to be a true mentor. He wanted you to be the best that you can be and wanted to bring out your strongest qualities. He encouraged you and was happy to see you succeed. It's very rare that you find mentors who are so selfless. I think that's the idea of being a mentor…you want your pupils to do well and sometimes they might even exceed your own expectations. Dr. Root was really a very special person to other orthopedic surgeons, residents and students. As for his patients, he really relished in how they overcame whatever handicap or adversity they faced—whether they needed orthopedic surgery or non-surgical intervention Dr. Root really inspired them to do and be their best."

Leon Root attended Rutgers University, earning a Bachelor of Science degree in 1951. He obtained his medical degree from New York Medical College in 1955, and interned as a general practitioner at Beth Israel Hospital in Newark, New Jersey. He completed his residency at St. Joseph's Hospital in Paterson, New Jersey, and then accepted a one-year fellowship at the Hospital for Special Surgery, where he remained for the rest of his career.

Anyone wishing to honor the life and work of Dr. Root may make a donation to the Pediatric Orthopedic Outreach program at the Hospital for Special Surgery (https://www.hss.edu/pediatric-outreach-program.asp). — *EH*

Leon Root, M.D., courtesy Brad Hess Photography

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