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Orthopedics This Week

# Education As a Competitive Weapon

**ROBIN YOUNG**

With that all too familiar knot of trepidation I gowned up and walked into the cadaver lab to do the deep dive into anterior hip surgery.

Luckily, no one offered me a scalpel.

For 25 years I've been a medical technology analyst and for the first time I was walking into a revered, even sacred space for hands-on surgical training to learn, along with a dozen experienced large joint surgeons, surgery.

Specifically, direct anterior hip replacement surgery.

More importantly…the company that took the risk of bringing this scribe into the cadaver lab wanted me to see something.

Medacta wanted me to see innovation in education.

My takeaway? This is an extraordinarily effective program which rises to the status of education to competitive tool—a weapon, in fact.

And it reminded me of other examples where education was the key factor behind eventual market leadership.

IBM trained two generations of IT professionals in the 1950s, 60s and 70s. They owned the #1 market share in business computing through that entire period.

Danek (now Medtronic Spine) trained a generation of spine surgeons in fusion surgery and to this day holds the #1 market share in spine fusion.



*Source: Medacta*

Synthes, through its relationship with the AO Foundation, trained a generation of trauma surgeons and made Synthes the #1 supplier of trauma implants and instruments in the world.

**Three Basic Axioms of Medical Education**

After that quarter century in the medical technology analysis game I've come to believe that there are three basic axioms of medical education.

- First: Every new procedure requires surgeon training and education
- Second: Two-thirds of what surgeons know they learned after medical school
- Finally: Ninety-nine percent of all corporate medical education programs are excuses to sell implants.

**Education Is the Horse, Not the Cart**

So when a company comes along that innovates the education process in a way that just about eliminates the in-hospital learning curve (indeed, surgeons call this Swiss firm an education company posing as an implant company) they start grabbing market share by the handful.

Medacta is presently battling with DePuy for the lead position in the fastest growing sector in large joint reconstruction—anterior hip replacement.

Medacta's education raison d'etre flows from its founder—Dr. Alberto Siccardi—who had two posterior hip procedures and became convinced that there had to be a better way.

Having sold his prior company, Siccardi had the capital to start an orthopedic com-

pany. And, like another Swiss organization, the AO Foundation, Siccardi put surgeon education and training at the center of everything his new company did.

Over time the Medacta approach to anterior hip surgery training evolved into three basic educational phases.

- **FIRST: REFERENCE CENTER VISIT**

  The Medacta approach is called AMIS—Anterior Minimally Invasive Surgery. The training can start with a video—the most popular is Tyler Goldberg's YouTube video which may be viewed at this link. (https://www.youtube.com/watch?v=awxaDtmCHfU&t=12s)

  But the formal training begins when you visit an AMIS Reference Center and scrub in to assist an AMIS surgery. Each student surgeon stays at this stage until they have viewed enough cases to feel comfortable with the prosthetic implants and surgical approach.

- **SECOND: AMIS LEARNING CENTER**

  Then Medacta, at their expense, hosts the student surgeon at a cadaver lab where they operate with the assistance of teaching surgeons, attend live surgeries, analyze difficult cases and go thoroughly into indications and contraindications.

- THIRD: SUPPORT FOR THE FIRST AMIS SURGERIES

  This final step is the most critical. Here, again at Medacta's expense, each new AMIS surgeon is assigned a reference surgeon who will travel to their location and assist and proctor for all initial surgeries. Under this proctoring approach, Medacta effectively minimizes early complications and builds enduring confidence in the direct anterior approach. Medacta's proctors will continue to support the student surgeon until they become proficient with the technique. Even the table, which is essential to the AMIS surgery, is provided at no cost as part of the company's general instrument offering.

As we saw first-hand, surgeons who complete this program are full converts to the anterior approach.

**Anterior Hip Replacement Data**

In 2013 *The New York Times* estimated that 20% of hip replacement surgeons had converted to the anterior approach. Today, that number is probably closer to 35-40%.

Ronald W. Singer M.D., one of the top orthopedic surgeons in the United States in practice with OrthoCarolina, described his conversion to the direct anterior approach this way.



*Ronald W. Singer, M.D. / Courtesy of Medacta*

"I'm a good example of a surgeon who started off posterior which I did for the better part of 20 years. I felt like I had great results. It was a mini-approach. I first saw the anterior approach in 2005 but it took me until 2012 to do my first case."

"I was like, 'well, it's hard to mess with what I'm doing. I've got happy patients. I've got a very busy practice. It's hard for me to change what I'm doing because I'm having success.'

"It really was me taking this to the Outpatient Surgery Center that drove the need and the desire—that lit the fire—to try to do it better."

"I got the opportunity to see Tyler Goldberg in Austin, Texas, and it was a day that I would call probably the best education day of my entire career. I started off doing the direct anterior approach on a standard OR bed and then sort of found the AMIS table which completely changed my world in every way."

Dr. Singer has a lot of support for his decision in the literature. A good study to look at is by Jose Rodriguez, Ron Cooper, Marcel Bas and others at Lenox Hill in New York that looked at the MRI volume data of muscles pre-op and post-op and compared direct anterior to posterior.

They reported that a direct anterior approach preserved the muscle volumes significantly more than the posterior approach. The posterior approach resulted in less muscle volume than anterior for the gluteus minimus, obturator internus, the externus, piriformis and the quadratus muscle groups. The charts below are from the study and they show quite clearly that this is the case.

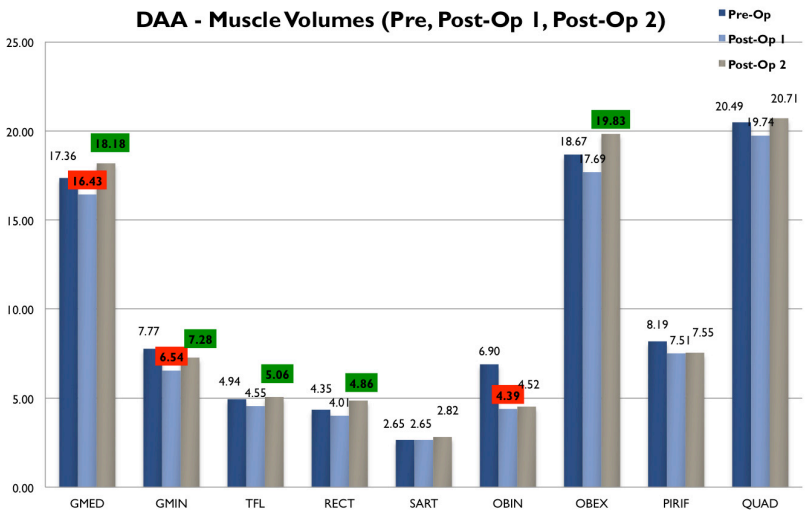
See table on page 3.

There was also a *Journal of Bone and Joint Surgery (JBJS)* article in which looked at inflammatory markers and evidence of muscle damage after anterior versus posterior approach. Those researchers reported a highly significant difference in muscle damage—like 5x difference anterior versus posterior approaches.

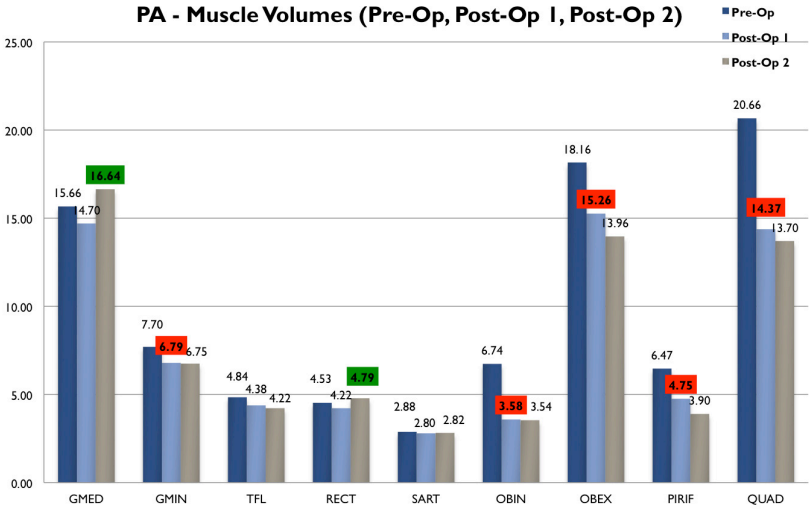
Other studies describe faster recovery times, less blood loss and shorter hospital stays. For the first few months, anterior hip patients tend to report less pain and more ambulation. After the initial six months, posterior and anterior hip patients tend to report the same levels of pain and ambulation.

Finally, a 2014 study by Sawadsky, et al., which was published in the *Journal of Arthroplasty (JOA)* looked at 150 consecutive cases of both direct anterior and posterior. The study reported:

## Muscle Volume Following a Direct Anterior Approach




## Muscle Volume Following a Posterior Approach




*Source: José A. Rodriguez MD, Marcel A. Bas MD, Jonathan Robinson MD, Timothy Deyer MD, Matthew S. Hepinstall MD, H. John Cooper MD, Amar S. Ranawat MD The Influence of Operative Approach on Muscle Atrophy after Total Hip Arthroplasty: A Prospective MRI-Based Comparison of Anterior and Posterior Approaches*

- Shorter hospital stays (2.7/2.9 vs 3.9)
- Earlier d/c to home vs. d/c to rehab (80%/84% vs 56%)
- Less use of assistive device at 6 weeks
- Less use of narcotics at 6 weeks
- Overall pain lower for DA

Returning to a comment from Dr. Singer, who explained why he, in effect, abandoned the posterior approach after 20 years. The logic of the human anatomy, he said, makes the anterior approach the only way to go.

"The logic for the anterior approach, going back to Robert Judet in the 1940s, is, first of the all, that the hip is an anterior structure. So it makes sense to approach from the anterior side. In addition, going anterior means going internervous and intermuscular so that also makes sense. Finally, you can do the exposure to the hip without any detachment of the soft tissue from the bone. The anterior approach totally makes sense."

### What's Old Is New Again

Ironically, even as the anterior hip approach is considered to be the brave new world of hip replacement surgery today, it was in fact the first approach—predating even John Charnley.

The first total hip arthroplasty (THA) was performed in 1947 by Robert Judet in Paris using the Hueter anterior approach. *JBJS* described the anterior approach in 1949 (*JBJS AM*. 1949 Jan; 31A (1):40-6). In fact, the anterior approach was the dominant hip replacement surgery technique for years before it inexplicably disappeared.

A few surgeons, most notably Kristaps Keggi (who used the anterior approach for over 3,000 hip replacements in the 1970s and 1980s) stuck with the anterior approach even as their colleagues went posterior.

Joel Matta and Frederic Laude led the resurgence in anterior approach in the 1990s.

Rich Berger's two-incision approach, while ultimately not a popular method, played a key role in moving the gestalt of hip surgery anteriorly.

Finally, education. There is nothing more fundamental or traditional than that.

Bottom line, is anyone really surprised that the Next New Thing in orthopedics is, in fact, the original procedure for THA and it is being driven by that oldest of human activities—education.

What's old is new again. ♦

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