THE SIXTH ANNUAL
CODMAN SHOULDER SOCIETY MEETING

SATURDAY, JUNE 22ND (4:00-8:00 PM)
Hilton San Diego Bayfront, Conference Center Room 310

"Give me something that is different, for there is a chance of its being better." – EA Codman, 1934

This year we are honored to have Dr. Robert Kaplan as our Keynote Speaker.

4:00-4:40 JP Warner: Welcome cocktail reception *(Conference Center 3rd Floor, Aqua Terrace Foyer)*

4:25-4:35 Group Photograph

4:40-4:45 **Jon J.P. Warner: Program Introduction**

KEYNOTE SPEAKER

Robert S. Kaplan, Ph.D.

KEYNOTE ADDRESS: HOW TO MEASURE OUTCOMES AND QUALITY IN HEALTHCARE

MODERATOR: DEREK HAAS

4:45-4:30 **Keynote Address**

4:30-5:45 **Discussion**

SESSION I: MEASURING TO IMPROVE OUTCOMES AND CARE

MODERATOR: DEREK HAAS

5:45-5:55 **Andrew Jawa:** ***Measuring the True Cost of Shoulder Arthroplasty: A Collaboration with Avant-Garde Healthcare***

5:55-6:00 **Discussion**

6:00-6:20 **DINNER BREAK**

DINNER PRESENTATIONS

6:20 -6:35 **Jon J.P. Warner:** ***Disruptive Innovation and Ambidexterity in an Academic Medical Center: Lessons from Harvard Business School***

6:35-6:50 **Jimmy May:** ***Disruptive Innovation in the Navy: Lessons from the Battlefield***

6:50-7:00 **Discussion**

SESSION II: RESEARCH FORUM—Open Discussion of Ongoing Projects and Future Ideas for Multicenter Collaboration

MODERATOR: JOAQUIN SANCHEZ-SOTELO

7:00- 7:05 **Introduction**

7:05-7:20 **Michael Freehill:** ***Using Blueprint to Predict Implants Used in Shoulder Arthroplasty***

7:20-7:35 **Eric Wagner:** ***Multicenter Evaluation of the Treatment for Irreparable Rotator Cuff Tears***

7:20-8:00 **Future Ideas**

- *Kyong Min: Posterior Shoulder Instability*
- *Eric Wagner: Internal Rotation After Reverse Shoulder Arthroplasty*
- *Jarrett Woodmass: Latarjet versus Bankart in the Setting of <15% Bone Loss*
- *Eric Wagner: Telemedicine for Post-Operative Follow-Up*
- *Danny Goel: Immersive Virtual Surgical Training*

CONCLUSION

SPEAKER: JON J.P. WARNER

On behalf of JP Warner and the C.S.S., we would like to formally thank Dr. James Esch, Larky Blunck, and the San Diego Shoulder Institute for their generous support and sponsorship




Program Speakers:

Derek Haas, CEO
Avant-Garde Health

Derek Haas is the CEO of Avant-garde Health, a venture-backed company whose mission is to help physicians and hospitals understand and improve care quality and cost across the care continuum. He has written 9 *Harvard Business Review* articles and been quoted by the *Wall Street Journal* in a front-page article. Previously, he worked on the staff of the President's Council of Economic Advisers, for Bain & Co, at Harvard Business School, and launched a small business health insurance program in partnership with the Chambers of Commerce in Massachusetts.

Avant-garde Health builds on his work as the Project Director and Fellow for Value-Based Health Care Delivery at the Harvard Business School, where he works with health care providers to help them better measure and manage their costs. Derek also teaches in HBS executive education courses related to value management in health care.

Derek holds an MBA and a BA in Economics from Harvard University, where he was elected to Phi Beta Kappa.

Robert S. (Bob) Kaplan, Senior Fellow and Marvin Bower Professor of Leadership Development, Emeritus

Harvard Business School

Robert S. Kaplan joined the faculty of Harvard Business School in 1984 after spending 16 years on the faculty of the business school at Carnegie-Mellon University, where he served as Dean from 1977 to 1983. Kaplan received a B.S. and M.S. in Electrical Engineering from M.I.T., a Ph.D. in operations Research from Cornell University, and honorary doctorates from several intercalation institutions. Kaplan's research, executive program teaching, and consulting focus on aligning cost and performance management systems to strategy education. He is co-developer of both activity-based costing (ABC) and the Balanced Scorecard (BSC). He currently works with Michael Porter on the HBS Value Based Health Care initiative to introduce time-driven activity-based costing (TDABC) to health care. The goal is to motivate the health care sector to restructure around delivering superior patient outcomes at significantly lower total costs.

Kaplan has authored or co-authored 14 books and more than 175 papers including 26 in *Harvard Business Review*. Elected to the Accounting Hall of Fame in 2006, he received the Outstanding Accounting Educator Award in 1988 from the AAA. He continues to be a leading global speaker on strategy execution, and cost and performance management.

Andrew Jawa, MD
New England Baptist Hospital

Dr. Jawa is a high-volume shoulder replacement surgeon at New England Baptist Hospital, a national leader in joint replacement surgery. His career began at Boston University Medical Center where he was an Assistant Professor of Orthopaedics. While at Boston University he specialized in complex upper extremity reconstruction for high-level trauma. He then joined Boston Sports & Shoulder Center to focus on shoulder replacement surgery, and he has grown to become one of the busiest shoulder replacement surgeons in the country.

He completed medical school training at the University of Pennsylvania Medical School and his residency at the Harvard Combined Orthopaedics Residency at Massachusetts General and Brigham and Women's hospitals. He completed two fellowships at Massachusetts General Hospital: Hand and Microsurgery, and Shoulder and Elbow Surgery.

Dr. Jawa is active in both clinical research and the education of residents and fellows. He trains residents from Tufts University, sports fellows from New England Baptist Hospital, and shoulder and elbow fellows from the Harvard Shoulder Fellowship Program. He has won both resident and fellow teaching awards for best instruction by an attending surgeon. He has published over 30 peer reviewed scientific papers and has made more than 40 presentations at national meetings. He is very active in the national orthopaedic community where he is a member of the American Shoulder and Elbow Surgeons (ASES), the New England Shoulder and Elbow Society (NESES), and the American Academy of Orthopaedic Surgeons (AAOS).

James May, Commander

Navy SEALs

Commander James “Jimmy” May is an active duty Navy SEAL (BUD/s Class 238) with over 18 years of service. He has completed seven deployments to the Middle East between 2002 and 2017. Jimmy has served on multiple SEAL Teams on both coasts. Recent positions include Executive Officer of the Naval Special Warfare Basic Training Command (~250 staff and instructors and 400-600 students), Deputy Commander for the Combined Joint Special Operations Task Force in Iraq (~1400 Special Operations personnel from 11 different countries) and is currently serving as the Naval Special Warfare Group ONE Operations Officer managing the training, logistics and force structure for all west coast-based SEAL Teams.

Commander May’s personal awards include three Bronze stars (one with valor), the Purple Heart, two Defense Meritorious Service Medals, two Meritorious Service Medals, a Joint Commendation Medal, three Navy and Marine Corps Commendation Medals (one with valor), Army Commendation Medal, Iraq and Afghanistan Campaign Medals, the Combat Action Ribbon (two awards) and a variety of unit and campaign awards.

He holds a BS from Texas A&M in Construction Science, is fluent in Arabic and is currently attending the Harvard Program for Leadership Development (PLD). Jimmy teaches Combat Leadership to all SEAL Platoon Officers and Senior Enlisted Chiefs across the Naval Special Warfare (NSW) Clemency on both coasts.

As of this writing, he has never served as a speaker outside of the NSW community.

Jon J.P. Warner, MD

Boston Shoulder Institute

Dr. Warner completed his medical degree and residency at the University of Rochester School of Medicine, NY, followed by a combined Harvard orthopedic surgery residency. He subsequently completed multiple research and clinical fellowships in Europe (Switzerland, France and Sweden) and in the USA (Children's Hospital-Boston and The Hospital for Special Surgery. He has also participated in Executive Programs at Harvard Business School and Harvard School of Public Health. At the University of Pittsburgh, Dr. Warner directed the Shoulder Biomechanics Laboratory and was Chief of the Shoulder Service as well as Associate Director of the Sports Medicine Center; Since coming to Harvard, he created the Shoulder Biomechanics Group and is the founder of the Boston Shoulder Institute, New England Shoulder and Elbow Society and the Codman Shoulder Society. Dr. Warner is a Professor in the Harvard Combined Orthopaedic Program, Chief Quality and Safety Officer and Chief of Shoulder Service at the MGH Orthopedic Department. He is a former President of the American Shoulder and Elbow Society. Dr. Warner is an Alumnus of Harvard Business School.

Dr. Warner is the author of over 100 peer review publications, more than 300 book chapters, and 5 books. His clinical and basic research has been recognized by more than 30 regional, national, and international awards. These have included the Kappa Delta Award of the American Academy of Orthopaedic Surgeons (Best Research in Orthopaedics), The O'Donoghue Award of the American Orthopaedic Society for Sports Medicine (Best Research in Sports Medicine), and The Neer Award of the American Shoulder and Elbow Surgeons (Best Research in Shoulder Problems).

Codman Shoulder Society Meeting 2019 Group Photo

Front Row:

Josef Eichenger, MD (Univ. South Carolina, Academic), Timothy Hartshorn, MD (Boston, MA), Jon Goff, MD (Marin, CA), Andrew Jawa, MD (NEBH, Boston, MA), Joaquin Sanchez-Sotello, MD, PhD (Mayo Clinic, MN), Jon Ticker, MD (Long Island, NY), Laurence D. Higgins, MD, MBA (VP Arthrex, Naples, Fl), James Esch, MD (President SDSI, CA), Jon "JP" Warner, MD (MGH, Boston, MA), "Cmdr. Jimmy May" (USN Seals, Coronado, CA), Asheesh Bedi, MD (Univ. Michigan), Capt. Matt Provencher, MD (Steadman Clinic, Vail, CO), John Costorous, MD (Stanford, CA), Anshu Singh, MD (Kaiser Permanente, CA), Patrick Denard, MD (Medford, OR), Danny Goel, MD (Vancouver, CN)

Back Row:

Bart Overturf (Smith and Nephew), Tom Borg, MBA (Mitek, J&J), John Hoyt (Trice), Tim Lanier (Wright Medical), Tyler Fox, MD (Univ. Kansas), Michael Messina, MD (Malvern, PA), Charles Smark, MD (USN), Gregory Gasbarro, MD (Baltimore, MD), Cory Stewart, MD (Mayo Clinic, Eau Claire, WI), Eric Wagner, MD (Emory, Atlanta, GA), Derek Haas, MBA (Boston, MA), Kyong Min, MD (Tripler Army Medical Ctr., Hawaii), Amon Ferry, MD (Scottsdale, AZ), Navid Ghalambor, MD (Orange, CA), Michael Freehill, MD (Univ. Michigan), Peter Vezerides, MD (Boston, MA), Jonathan Bravman, MD (Univ. Colorado, Denver, CA), Jeremie Axe, MD (Newark, DE), Chris Kilburn-Peterson (Mitek, J&J), Deryk Jones, MD (New Orleans, LA), Orsa Britton, MBA (Zimmer), Edward Yian, MD (Kaiser Permanente, Anaheim, CA), Louis Shi, MD (University of Chicago), Jillian Haberli (Boston Shoulder Institute), Jeffrey Zanni (Vyaire Medical), Nick Byrne (Wright Medical)

Former fellows denoted in Blue

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Welcome & Overview of the Codman Shoulder Society®

I want to offer a big thanks to Jim Esch and Larky Blunk of The San Diego Shoulder Institute, who not only support this program financially, but in spirit as well. This support has really allowed the Annual CSS Meeting to be something of a test kitchen for the San Diego Shoulder Institute (SDSI). A word about the SDSI…Founded by James Esch in 1983, the meeting has become the leading shoulder meeting in the USA and in the world. Every June experts from around the world come to San Diego to present, discuss, and debate the state of the art of shoulder surgery. This includes lectures, panels, labs, and a unique blend with Industry representation for the latest techniques ranging from Arthroscopy to Arthroplasty and Reconstruction. There is no other meeting in the world as broad and deep in shoulder education. The CSS is please to tag along and follow this great meeting.

I want to thank our Keynote Speaker, Bob [Kaplan] for being so generous of his time and helping us with our mission as an organization of individuals dedicated to innovating value in shoulder care. Many of you may not realize Bob's impact in business as he has been a preeminent leader in Value-Based Healthcare by applying innovate approaches to quantitative measurement of "value." He is currently, Senior Fellow and Marvin Bower Professor of Leadership Development, Emeritus, at Harvard Business School.

I would also like to thank our other esteemed speakers and guests. In addition to Bob Kaplan we have Jimmy May, who is Commander and Active Duty Navy SEAL in charge of training Navy SEAL recruits at Coronado. He was also a classmate of mine at Harvard Business School this past year. Derek Haas, MBA is the President of Avant-Garde Health, a business grown out of his interest at HBS in measuring value. Andrew Jawa, MD is an orthopedic surgeon at NEBH in Boston with a particular interest in measurement of value. And, we are fortunate to have representatives from industry including Wright Medical, Johnson and Johnson, Zimmer, Vyaire Medical, Smith and Nephew, Trice, Depuy, and Stryker.

Just a brief word, this is named the Codman Shoulder Society (CSS). I work at Mass General which was the home of E. Amory Codman. He proposed the concept of the "end result" and innovated care more than a century ago before "value-based care" became an area of interest at Harvard Business School and other academic settings around the country. I created the CSS organization to honor Codman by continuing his work through collaboration across a global community of orthopedic surgeons specializing in shoulder care. Moreover, I wanted to involve industry as our partners with an "all boats float" philosophy which stimulates innovation across

all spaces, academic and industry. Perhaps through our efforts we can achieve the goals of both Codman and our colleagues at HBS, namely to innovate value in shoulder care.

Finally, I want to thank everybody who came here from so far away. There are a number of you who I know came specifically for this meeting. I'd like to remind everyone that attending the SDSI prior to our meeting is probably the best value you can get in your shoulder education during the year.

So, with that I'm going to turn over the podium to Derek Haas who will start Part I of our program by moderating Bob Kaplan's presentation on Measuring to deliver value in healthcare.

SESSION I: MEASURING TO IMPROVE OUTCOMES AND CARE:


Derek Haas, MBA

Thank you, JP. It's my pleasure to introduce Bob Kaplan who is senior fellow, Marvin Bower Professor, and emeritus at Harvard Business School. He's codeveloped both "Activity Based Costing" as well as the "The Balanced Score Card." Throughout the last decade, he and his colleague at HBS, Professor Michael Porter, have been leading the charge around value-based health care delivery. I've had the pleasure of working with Bob for the past 6.5 years both on the research side and then also through Avant Garde Health and helping to take a lot of these ideas and help organizations put them in practice. My favorite story about Bob was a few years ago, my buddy and I were kayaking, we were on a double kayak, and he was in a single kayak and we could not keep up with him. At one point he circled back and asked if I wanted to trade kayaks with him. So, with that, I'd would like to present Bob.

Robert Kaplan, Ph.D.

To access Bob Kaplan's presentation and entire discussion please click on the following link (CSS Channel on vumedi.com): Applying Value-Based Healthcare to Orthopedic Surgeries

For Bob's presentation as a pdf click here.

Applying Value-Based Healthcare to Orthopedic Surgeries

Transcript of Bob's presentation follows:

Well thank you very much Derek and JP. I wish I could be there with you, but I'm actually at a summer home where I have kayaked with Derek 6 summers ago and it's pretty nice here as well.

In this time, I want to share the framework of value-based healthcare and why we think it's important. There is tremendous opportunity here, especially for orthopedic surgeons and shoulder surgeons, I think I will be able to share my presentation now and this will take about 30 minutes and Derek will moderate a discussion for 15 minutes where we will have a chance to raise questions or concerns so we can have that interactive dialogue.

So, first we should define what we mean by value-based healthcare. Everybody in healthcare is talking about value, though the term has become meaningless, it almost means that you're doing

something different than what you did last year so it must be value. But we actually have a very specific definition for value-based healthcare, and we think it's the right definition. Instead what the goal should be is to improve outcomes that matter to patients. Value is created when we make patients better off, and the second part, to do this at less cost to society. That doesn't mean less charges, it means doing it more efficiently with a better set of resources to deliver superior value to the patient.

There are two more components to this, which is the way you measure the value and value has to be measured at a medical condition level. It cannot be measured at a hospital level, or a surgical practice level. It actually has to be measured where we are to create benefits to the patient, which is curing and dealing with the patient's medical condition. And not just look at it as a surgical episode but look at it as a part of a higher cycle of care, from the time the person is presenting with a problem, in this case that would benefit from surgical intervention, all the way through the surgery, recovery in the hospital, discharge, and recovery after the discharge. That's all we mean by the cycle of care.

So, value-based healthcare is back to the four components: Improve outcomes that matter to patients, lower the cost of delivering that benefit, measure at the medical condition level over the complete treatment cycle for that condition. Now, it would be very reasonable to say, "Why do we need this?", "What is the problem that exists today in healthcare that value based health care is designed to solve?" Because we have a lot of problems in healthcare. We have problems with affordability, and patient access, and cost, one of the specific motivating factors that lead us to this solution? Because I thought about this and as I worked on it over the last 9 years, I think there's only two fundamental factors that really impress me. The first, is that there's this enormous and invisible variation today in the outcomes that are being delivered to patients and the costing curve to deliver the outcome. So, there's this invisible hidden variation in both outcomes and cost at the provider level that certainly patients don't know about, payers don't know about, and most importantly, the providers themselves don't know about because they're mot measuring their outcomes and cost correctly.

So, here's some specific examples:
There's a very high volume of prostate cancer treatment centers in Hamburg. I'll talk more about this as the session goes on, and their five-year survival rates are the same as other hospitals in Germany that treat prostate cancer. But when you look at the outcomes that matter to patients, incontinence and impotence that are associated with treating this condition, the incidences of incontinence and impotence at this high-volume hospital are 25% of the average of German hospitals. And this is not normally known, and people are not aware of this variation that exists provider to provider in outcomes that matter to the patient. Currently, we just got into collaborative work with the American College of Surgeons and we're very excited about this official announcement to be made in the middle of next month. One of the reasons we're excited about this is ACS already has a very active measurement program, not quite for patient outcomes, but at least for clinical outcomes, things that can go wrong as you see in the left column here across thousands of hospitals in the United States. So, they have already deployed a measurement technology to at least look at adverse outcomes, clinical outcomes that are occurring when surgery occurs. And what you see here is what we call a caterpillar chart, but this is ranked by the lowest incidence complication hospitals on the left and the highest incidence.

You can see this enormous variation across hospitals in the incidence of adverse clinical outcomes. Even within the same hospitals you can see the range of quantity across the surgeries being done for specific medical conditions. Huge variation across hospitals and within hospitals. And until this group came along and started measuring this, this was invisible. People did not know how much variation existed, and a hospital would not know if it was above or below the median on this important statistic. Cost also has this huge variation, and so this is a slide based on something Derek and I did in 2014, where we looked at 30 high volume hospitals doing total hip and total knee replacements. Unlike the story I'll be telling in a few moments, these are all high-volume hospitals. They are doing several hundred of these per year. We brought their project teams to Boston on a cold January morning, and we spent the first half day with them how to do costing correctly. In the afternoon we talked about project management to help them get organized. They went home to their hospitals and spent the next three months with mostly Derek facilitating this and answering questions. Three months later we got the data back, they were confidential, only Derek saw all of the numbers, but we could see is that the ratio of cost for the hospital at the 90th percentile of cost to the 10th percentile was more than 2:1 on personnel costs. They're treating the same patients, they're getting the same outcomes, and they're getting 2x as many resources as the hospital at the 10th percentile. A 2:1 variation between the 90th percentile and 10th percentile! And these hospitals never knew where they stood. There was a lot of things, it wasn't just one big thing, there was a lot of opportunity.

The first factor driving value-based healthcare is to try to reduce this enormous variation in both outcomes and cost. It doesn't require any new technology. We could freeze research and development, and we could freeze any new progress, device, or procedure. And just by bringing people from the 10th to the 50th percentile, to the 75th or the 90th percentile, it would be an enormous increase in the outcomes being delivered to patients and great reduction in the cost of achieving those outcomes. So that's really the first opportunity, and we discovered this from Derek's company, Avant Garde Health, even in the same hospital we've got a dozen surgeons doing rotator cuff repairs. There's a 1.8:1 ratio from the highest cost surgeon to the lowest cost surgeon treating the same type of patients, even in the same clinical practice. This was invisible and unknown until we came in to help them measure the cost in an accurate way

The second motivation of value-based healthcare is to try to move away from a highly dysfunctional payment system. Much of the problem we have today in healthcare is driven by the dysfunctional motivation associated with fee for service payments that reward volume but not value, or outcomes and lower cost. Global budgets actually have the opposite problem, they try to suppress volume, they're paid a fixed amount, so their motivation is to do less work and collect the same amount of money. Recently, especially in the Affordable Care Act, there's a move to capitation, and accountable care organizations, which is a step in the right direction, directionally correct, but now where we want to end up. Ultimately, we want to end up at fewer types of procedures, of shoulder surgery, you can get there. If a half bundle payment, single payment, associated with fixing that patient's problem, and that includes all the resources both pre-op, op, and post-op, and post discharge associated with it without getting into much more detail.

So, I just wanted to start with the problems that value based healthcare is designed to solve, is to reduce the very high invisible variation in both outcomes and cost that exist today throughout the

healthcare system, and this is true in Europe and Asia. And the second is to try to move the sector as quickly as we can to a much more aligned payment mechanism that rewards the practices of the providers who are both effective and efficient in delivering outcomes and use of resources to deliver those outcomes.

So, with that as background now we can move on to "How do we do this?" What does the solution look like? Now I'm going to focus on four steps. One is the reorganization of the way we care for patients using what we call integrative practice units (IPUs), using multidisciplinary teams that specialize in that medical condition. Two is we have to start measuring, communicating, and improving the outcomes we deliver to patients. Three, costing, we must measure cost correctly and then work to improve them. Deliver the same outcomes with a lower cost and then we're getting ready to bundle. The move to bundle payments will reward the effective and efficient provider.

I'm going to quickly go through the four that set the stage for the remainder of the talk. We'll talk first about the multi-disciplinary teams like IPUs, and I'm going to illustrate this with how this high-volume prostate cancer center in Hamburg Germany is organized. They have 9 surgeons and they actually only deal with prostate cancer patients, they don't deal with any other urological problem. They are just focused on patients that present with treatable prostate cancer. They have 39 nurses and that's all they see, the same prostate cancer patients, so they know all about these patients and how to treat them and how to deal with their concerns. Physiotherapists, psychologists, oncologists, and anesthesiologists technically are employed by the academic medical center across the street from this clinic, but they are dedicated to prostate cancer patients. And of course, social workers who deal with patient's families and this is a significant enough practice where they have biostatisticians that collect a lot of data, dedicating to streamlining and optimizing care for prostate cancer patients. And they do 2500 prostatectomies a year, which is the highest in the world. Johns Hopkins who invented the procedure, Mayo Clinic, top two in the US, and they run about 1500-1700 a year. But these are high volume, focused, dedicated teams working on this significant condition. So, this really kind of motivates why we like IPUs, one is they can concentrate volume for that condition. I show a slide that both Dr. Warner and Larry Higgins showed me with volumes in shoulder surgery, and I was stunned by the data. 80% of the physicians who are doing complex shoulder surgery do 5 or few a year, that's stunning! There's only a few like those of you in this room that do several hundred a year. Well anyways, you look at the outcomes and cost, you do much better when you're doing several hundred a year than the orthopedic surgeon who does it 5 times a year. So, we really want these dedicated teams that can concentrate on that condition. But, it's not just a great surgeon, we have to have the nurses, we have to have the anesthesiologists, the physiotherapists, the rehab, and potential the nutritionist and the psychologist and social worker, because a lot of what will make for a successful recovery is dealing with the patient's social determinants of health. There are limits to how much surgery can do, and patients do vary by various other non-medical factors that are important to consider. These multidisciplinary teams can address those social determinants of health, then you're in the position to optimize the care, not just in the surgery room but downstream for the physical therapy, and the physical therapy post-discharge, and also upstream. Getting the patient ready for surgery, cessation of poking and substance abuse, reduce in obesity, getting diabetes under control. So, you must be able to manage upstream and

downstream not just in the surgical suite to really optimize great health outcomes. These IPUs we feel will help reorganize care not by specialty, but by the patient's condition.

Second, is our ability to start measuring outcomes that matter to the patient. Now, we see from CMS and ACS increasingly we are picking up some kinds of outcomes. So, if I had to say, the evolution of outcome measurement it particularly appropriate for those of you who are coming to the Codman Society with Dr. Codman more than 100 years ago was the advocate for outcome measurement and it has literally taken us more than 100 years to finally realize his vision at that time. So, for a long time, all we did was measure incomes, and this is what the accreditation is, "how many board-certified surgeons do you have? What's the quality of the facility you have? Do you have up to date equipment?" So, they are certifying the input into treatment, facilities and personnel. Then the quality movement, checkless movement came in, and we start to measure our compliance to delivering our care at the right time, and various other surgical checklists so we don't lose gauze pads inside the patients. And then we still realize that we're still getting problems, and this is where the quality movement comes in, so we're now measuring incidence and safety, and all of the adverse events and medication errors and infections within the hospital. So, we're feeling good, we're starting to measure outcomes. But let me tell you, patients go to you to have surgery, they actually don't expect to have bad outcomes. They want you to cure their problem, they want you to avoid problems or they wouldn't go to surgery in the first place. These are issues for the surgeons to deal with, but the patient doesn't think its successful if you manage to not have complications or infections. We must advance our measurements of outcomes to outcomes that the patients care about. This is specific to condition: the outcomes you measure for rotator cuff repairs are different from what you'd measure for knee and hip replacement, are they're certainly different from cardiac surgery or prostate cancer surgery, or diabetes. Outcomes for patients have to be defined at a medical condition level and many of them are going to be subjective, they will have to be patient reported outcomes. They may be subjective, but they're more accurate than not doing it. Patients want to be able to resume their activities of daily life before this condition. In the case of the Hamburg prostate cancer treatment, it has a mix of both clinical outcomes you see on the left, but also the patient outcomes on the right. This clinic measures those aspects before the surgery, so you know you have a baseline. So, if the patient is incontinent before the surgery, that's not likely to be cured after the surgery, that's not a realistic expectation. What's the baseline, where were they when they came in, where are they upon discharge, and then they measure 6 months later, a year later, 5 years later, and they get 95% response rates, so they can really track the outcomes and see how sustainable their intervention is. How they use these outcomes other than reporting it publicly, they use them for improvement. This is a picture of the meeting the surgeons have every 6 months, and biostatisticians are recording the performances of surgeons on their clinical and patient reported outcomes for all the surgeries that went on in the previous 6 months. The founder of this clinic, the chairman, and the head of the department, at one of these meetings it was found that he had the worse incidences of adverse events of anybody in the practice. For any other organization, this would be the end of outcome measurement in that practice. But this doctor is a very thoughtful person and wants to do what's right for the patient, and he asked the junior surgeon who had performed the best on this dimension could he watch that surgeon do the surgeries and learn from him as to what he was doing, and have that junior surgeon observe him in his surgeries. Six months later, this doctor is as good as anyone else in the clinic. This use of outcomes, for both learning and improvement, to know where you go for best practices to know

what problems have to be fixed and improved, it is a very powerful tool, not just for accountability, but for getting better, and getting your practice up to the best in your specialty. If you took the time to drive north from where you are today to Irvine, you'll find Hoag Orthopedic Institute, very high-volume institute just focused on orthopedic surgery, a lot like New England Baptist. Again, highest volume in California, lowest readmission rate, lowest complication rates every year. They publish a book that reports their outcomes for the past year, and I've been looking at these books for the past 6 years. In preparing this talk, I just went on the web and I could click on 2018, and I could download their outcomes report and look through. So, think about that accountability that they have to their payers and their patients, and their employers who are sending their employees there for delivering the best outcomes you can for this portfolio of orthopedic surgeon.

Third component, Derek and I have had the most impact and focus, is to measure and improve cost using a technique that I helped develop and invent in general, not for healthcare. It was used first in manufacturing and services industry all over the world, but in the last 9 years we have been applying it in healthcare, and it's been perfect for healthcare. If we hadn't invented it before for manufacturing and financial services and retailers, we wouldn't have invented this for healthcare. Because it really starts with how you're delivering care, what activities do you perform over this entire cycle of care; presurgical visits, presurgical preparations the day of surgery, discharge, recovery. For all of these activities, we found out who is doing each step and how long it takes. Every person or piece of equipment that's used in the patient's treatment cycle, we work out what does it cost to have that equipment available and used on that person, and then of course we add in the materials supplies, implants, and used in treating the patient across the cycle of care. So, what I'm showing you is the detailed map of what happens to the patient. There are some diamonds in there, those are the position points, depending on the position of the patient. Whether one must go one route, and another must go another route. So, we get a handful of variation. Interesting here, there are a half a dozen different types of personnel involved just in this single map. The little circles you see with the numbers is the estimate in minutes that particular personnel type spends with the patient, and we do this throughout the cycle of care. We get this from surveys, interviews, and sometimes we shadow the patient and have someone record how much time is spent with them. Over time, we want to be able to do this electronically with things like Bluetooth or whatever technology can automatically track patients. Step two, there's only two steps and this is the second one, for each type of personnel and each type of equipment, what does it cost to have them available to treat the patient. So, the numerator is the salary, benefits, office space, personal technology, and the second part, the denominator, is how much time is utilized. We estimate how many days a year that person shows up for working with patients, this is a matter of weekends, and holidays, and dictations, how many days they actually show up for work to help patients. For those days, typically how many minutes over the course of that day are they available for clinical work as a matter of meals and biological breaks, and meetings. So, you multiply the number of days by the minutes per day, and you end up with the total minutes per year, which is typically between 90,000 and 110,000 minutes per year. Then we can calculate the cost per minute with the numerator divided by the denominator. On this slide we see the range, so we have surgeons like you that could be $6 a minute, some could be double that, but other people showing up like nurses and physicians assistants all the way on the right, or our office staff. And what you see is this 12:1, 15:1 ratio between the highest cost personnel and the least costing personnel. And I

have to tell you, when hospitals are trying to save money, the people they fire are not the surgeons or the nurses, they need those. They fire people on the right-hand side of this chart. It's interesting, they get rid of all the assistants and scribes, but the work those people were doing doesn't go away, so who gets to do that work? $6 per minute surgeon or $1.5 per minute nurse, so it's a very foolish way of doing cost cutting because the CFO doesn't really understand what drives cost in hospitals. They don't look at it in this way. And as you see, it's very inefficient to have physicians doing this work that people pay much less to do as well at a much lower cost, so they like it. So once we have these two features, then we can take all of our maps, almost two dozen maps for rotator cuff surgery, and then we figure out the total number of minutes each type of personnel and we know the cost per minute of those people, and we just multiply it and add it up in an Excel spreadsheet, well Derek's company has it automated to do it in a more efficient way. Costing a department is extremely simple, it's just how much time is being taken by each resource and how much does the resource cost. Now, one of the things that I know Derek learned at one of your sites is when we saw that variation in cost for surgeons, some of it is from the type of patients they see, and when you control for complexity, you actually see that the higher cost is associated with more severe care, so that's a really interesting insight. What that enables you to do is you look at this person who's in the middle in the blue where they thought they were right at the average, they were actually much higher cost, they were dealing with a simple mix of patients, and the reason they were average was because they had mostly very simple types of rotator cuff repairs. The person who looked most efficient out here on the right, was actually average efficiency, so that physician must have been dealing with a much more complex mix of patients which is associated with that higher cost.

Just some simple examples of how accurate of how cost informs a practice to work our way to improvement, to eliminate steps that aren't adding value to the patients, better outcomes. We can redesign these processes to reduce waste and idle time. Most importantly, we can optimize the care. We spend more time early in the process working with the patients and educating their families to help with compliance. By spending $100 or $50 early in the cycle, you save thousands of dollars in avoidable complications by having the patient be more compliant. If you understand your costs well, and you improve them, and you optimize them, you're much more confident in entering into bundled payment contracts, because you're going to be the winner in these contracts.

So that is the full picture of what is a value based bundled payment. It's a single payment, and typically what we pride ourselves on is we don't get 10 bills scattered over the next 6 months. We get a single bill for the physician and it covers the full set of services for treating the patient over their treatment cycle. We don't have this today, but we should have it eventually. These payments should be contingent on the outcomes; if you have bad outcomes you shouldn't get paid as much, or maybe not at all. So, you're held accountable for what we would call the "clinical risk" associated with being a physician, and that's going to require some risk adjustment just as you saw with the rotator cuff with small tears versus very large tears. But there's an accountability that you now have to the patients, the families, the payers for delivering good outcomes efficiently. Increasingly employers are going this way, it's a very optimistic trend that we see. So, Walmart is starting to have contracts with various healthcare providers, and if you look at the list of providers, these are excellent providers for bundled payments treating complex conditions that their patients have. They will pay for two airfares for the patient and

either a family member or caregiver to travel to one of those centers of excellence. At first, they're screened to make sure that the intervention is appropriate and we're not doing unnecessary surgery. So, we're very strong advocates of this, we're trying to work hard with corporations who have clientele at Harvard Business School to encourage them to enter into these bundled payment contracts, and we hope it will be with your practices, so you can be the recognized leader and give the best outcomes to patients.

So that's the story. Why value-based healthcare? To get rid of some of the invisible variation in outcomes and cost that exists today and move us to a much better aligned payment system. So, Derek, that's my talk and let's open it up to comments and discussion.

Discussion:

For link (on vumedi.com) to the discussion on Bob Kaplan's presentation click here: Codman Shoulder Society 2019 - Discussion

Derek: So, I mentioned I'll ask him a few questions and I'd love to open it up to questions and conversation with everybody here. Bob, I'm sure many people think this sounds extremely exciting, what part of the value agenda would you suggest to people in getting started in their practice, and how would you suggest them going about getting started?

Bob Kaplan: I think any of the first three opportunities are a good start. Can we really develop a practice unit around this specific orthopedic surgery or shoulder surgery you're doing? Can you bring in anesthesiologists, who are just going to focus on this, and nurses, and physical therapists in your facilities that really just become experts because they're dedicated to that shoulder surgery for which you want to be doing high volume. You really should start measuring outcomes, and I know Dr. Warner and Dr. Higgins showed me that they're measuring outcomes which have to do with strength and flexibility, and have patients report whether they can serve a tennis ball or hit a golf ball and how well they're doing compared to where they were before the surgery. I think those are both feasible to start doing right away. We hope by the end of this that some of you will get interested, like Dr. Warner and Dr. Higgins have done, in really understanding the cost of how you're treating patients and improve that and optimize that cost. Get people working to lower their total cost of delivering care to your patients. I'd love to see you take on all three of these, but I think that taking on at least one of these will start us moving in the right direction. I showed you the multi-site study that Derek and I did on total hip and knee replacements 5 or 6 years ago. There's really nothing stopping the rest of you in that audience today saying that I'd like to be a part of that multi-site study and I want to see whether I'm in the

tenth percentile for cost or if I'm in the ninetieth percentile, because even those who were in the lowest twenty fifth percentile of cost for the total joint procedure, they were not in the lowest twenty fifth percentile for every one of the major steps in that procedure. Every single one of those thirty hospitals found the opportunity to improve. Once they could learn from their pain management approaches, their physical therapy approaches, the patient preparation, discharge procedures, etc. this gave them insight to improve. A huge amount of learning occurs when you can take high volume surgery, motivated people, and get good measures of your outcomes and cost, and then learn from each other to get better. This is not a zero-sum game. We want the increase in surgical volume of say joint replacement, to go to each of you in the room rather than to the surgeons who are doing fewer than a half dozen per year on this very complex joint (the shoulder) with which you're associated.

Derek: Just building on our last point, Bob, considering some of these things like the bundled payments or the cost improvement plans that could involve other parties inside of their organizations, how do you advise people to try to get buy in from other folks (in their institution) needed to move forward?

Bob: Again, I think we have learned so much from Drs. Higgins and Warner, we have this wonderful picture that they show where they had a training program for physical therapists in eastern Massachusetts. For your patients that don't live in Boston, who live throughout New England, they don't want to have to drive all the way to downtown Boston for physical therapy 3 days per week. So, they reached out to physical therapists and opened the course and we want to show the kind of therapy that we want and if you attend the course, we'll certify you, so any of our patients that come from your town, we're going to send them to you. But, we want you to deliver the care that we want. Even though Medicare pays for 15 visits at 55 minutes each, we think we can get the therapy we want in ten visits at 35 minutes each, this is what we want you doing on visit one, visit two. And now you're really getting ready for another collaboration, to offer this surgical procedure to local corporations, potentially local health plans, because you're prepared to take on the risk in that cycle of care for both the outcomes and the cost. Then you have to start negotiating with the payers, but also reaching out to various corporations that want to move the bundles, because corporations want their patients to be treated at the best providers to cure their problems and get them back to work as soon as possible. So, the corporate interest, the employer interest is identical to the patient's interest. That's another collaboration that you need to reach out to local employers and local employer groups so you can be that center of excellence for the region for this specific procedure. You can reach out to your supplier, like where Dr. Higgins is now, we're going to use you as an exclusive supplier, we like your stuff, we'd like to negotiate a good price for that for our practice.

JP Warner: So, Bob, I just want to direct the conversation a little bit because we're missing behavioral economics here. This is wonderful, it's terrific, but behavior is driven by "what's in it for me" motivation. We have a number of stakeholders here, including leaders of industry. These are the people who innovate and make the products that are used by surgeons and they would want to know "if I'm on the table or at the table". We should also remember the stakeholders who run our hospitals and ASCs as they too have to extract value.

Michael Porter wrote about tiers of value, including long term value, the durability which isn't really a part of the equation for the doctor or the hospital from the stand point as the value

they extract is short term, but the patient captures all that value in the long term. A case-in-point is highly cross-linked polyethylene which results in a more durable outcome for total joint replacement; yet despite this obvious value to patients some hospitals were reticent to allow their surgeons to use this new technology because the price point was higher than that for that conventional polyethylene. Clearly the patient would benefit from longevity of a more durable bearing surface, though the hospital would have to pay more for the implant. So perhaps you can comment a bit on how we align with our suppliers, the hospital and most importantly, the interest of the patient. This is a key question when one considers application of new technology and who benefits from it given price pressures in the healthcare marketplace.

Bob: That's an interesting, complicated, and somewhat multifaceted question. For the past two years I've been closely studying ***Medtronic***. The CEO, Omar Ishrak, says that he wants Medtronic to be the leader in value-based healthcare. What that says is that Medtronic want to partner with their physician base and will share the risk associated with some of the contracts, so if you buy our product, we'll give you guarantees on the product and we may even give you discount on the product. Then, if it delivers the performance we believe it can, we want to share some of the (financial) benefits of the more durable outcomes. Omar has stated (historically) for 65-70 years, that Medtronic has been paid for the technology it has produced, but now they want to get paid for the outcomes their technology can produce. So now it's possible that more of the suppliers (companies) might want to be like Medtronic. Perhaps Larry's leadership team (at Arthrex) should start offering that sort of thing. It's actually a positive sum game, since all stakeholders can win (The company-vendor, the hospital, the patient, the surgeon).

Now candidly, what makes it hard is the second part of your question, that if we do this right, there may be less volume going to hospitals. One reason is that there will be fewer revision surgeries after two years. We should build that into the bundled payment contracts to reward those who are really doing the right thing for the patient and delivering excellent outcomes not only in the short term, but the long term. But the hospitals are the problem as they profit in a fee-for-service marketplace, and it gets them to do stupid things. It's not just in orthopedic surgery, it's in general surgery. If there's a general surgeon who wants fast recovery that will get the patient up and active after surgery and requires using an analgesic that's 30-40% more expensive than what's in the formulary, the system won't let them use it because it's more expensive. And the surgeon could say, "but wait, it's going to cut at least two days off of the hospital stay by doing this. Instead of paying $80 I'll pay $120 and get them out two days earlier." But the secret is that's not good for the hospital to get them out two days earlier because they're currently getting paid for those two days. If you go to bundled payments, they're not getting paid for those extra two days, they're getting paid a fixed amount for the entire procedure, and that's why the payment mechanism may force the hospital to get better aligned to ethical clinical practice, including the behavioral things, the behavior is important. That's why you have psychologists and behavioral people at integrated practice units to really work with the patients and help them to better understand and motivate them to stay compliant when getting ready for the surgery as well as the recovery after surgery.

JP Warner: Larry's going to make a comment and we have other members from industry who I really want to weigh in on this, but perhaps a psychologist would do best to help us with hospital executives rather than the patients; but, I'll let Larry comment.

Larry Higgins: Bob, good seeing you, thanks for joining us. You make some interesting points with your thoughts on Medtronic. We've talked about a company you just mentioned exiting the total joint business. You've probably heard they've closed their acquisition of ***Responsive orthopedics*** which was a low-cost joint arthroplasty play for them. Even Omar who is committed to value-based opportunity here, made a strategic decision not to participate there (in arthroplasty) …

Bob: Part of that problem was that not enough hospitals were in a bundled payment contract where it was in their best interest to get that Medtronic lower the cost of the device. So, it is strange, because it's covered in the DRG, so with the lower price even on a fee-for-service, it's included in the hospital's cost, so I'm not exactly sure why of all that went on.

Larry Higgins: I think it is interesting to note the slow roll out of these bundled opportunities, and how large systems are not talking about population health and opportunities in that realm. And walking back even though the CJR data, at least that's coming out early, shows that they have been able to save money, particularly when you look at the post-acute care management of a patient, that seemed to be the most effective, where the bundled payments were effective had about 2.5% post- acute care admission versus 33% admission for the ones in the control group. But I would say having been on both sides of the equation, that the hospitals are ambivalent on measuring value, particularly when we look at opportunities to drive the time-value of money. When you shorten a procedure (and expect a cost savings), they're (the hospital) particularly insensitive about that. What conversations should we be having with a hospital administrator? If you could show them that with better technology, you could cut 30-35 minutes off a procedure, it's a difficult conversation from a manufacturer's standpoint, also from a surgeon's standpoint to start that conversation. So, what would you advise us to get the hospitals to be a collaborator?

Bob: I know that you, JP, and I are somewhat frustrated with the hospitals in our local area, but I have to tell you speaking to the people at Mayo Clinic, the new leadership there, as well as the new leadership at Cleveland Clinic, they kind of see what's coming. They see the pressure that's going to be put on their healthcare system. If you just look at this Medicare for all in the political sphere, what most people don't realize is that Medicare for all will likely mean Medicare prices for all. The Mayo Clinics and the Cleveland Clinics are reexamining in even more detail their internal operations to find out how to drive cost down in their system. So, if even the government moves to a Medicare for all model, they can make positive margins for the hospital. But, (Mayo and Cleveland Clinic) they tend to have visionary CEOs that are proactive and are in centers of excellence programs. So, we look at Walmart, General Electric, and ask where are they going for healthcare for their workers? They're going to Mayo clinic and to Cleveland Clinic. They're not going to the hospitals that employ you and Dr. Warner, because somehow, we (HBS) hasn't been able to penetrate that leadership. What bundled payments does is it empower the surgical practice (to drive value in care delivered). If you can own the bundle, you can contract separately with the bundle for where you do your inpatient surgeries (and outpatient surgeries). Some of that is going on at the Brigham and Women's Hospital (BWH), Larry. Instead of doing much of the Orthopedic Surgery at your Francis Street main campus (for BWH), you would go to Faulkner for most of your orthopedic surgeries because that was a lower cost facility. And JP (and his colleagues) are working more in Mass General West (for surgeries that used to be done at MGH). This will be the trend to try to align with hospital leaders to help them see what's

coming. This is going to be price pressure on hospitals and which will require that surgical procedures start to optimize the resources and improve efficiency today so you're ready for that new environment.

The other frustrating thing is the people who are not playing in this framework are the private insurers. They have the most to benefit from in being in a fee-for service system. The more complex your orthopedics procedures are if your patients are employed and receive their health insurance through their employer, they'll be able to go directly to their employers who will say, "Come to us. We can deliver you better outcomes, get you back to work faster with no complications by creating a value-based approach not offered by the historical private insurance plan." In such situations the experts and higher volume surgeons will treat patients as it will be expensive if these patients bare treated by surgeons who only do five cases of such complex surgery per year. That's another opportunity for a collaboration between employer groups or any significant employer in your region to try to capture that business.

JP Warner: So, Bob, we have a question from Joaquin Sanchez-Sotelo, senior shoulder surgeon at Mayo Clinic, one of the organizations you mentioned.

Joaquin Sanchez-Sotelo: Hi Prof. Kaplan and congratulations on your great presentation, I learned so much. So, I have been put in charge to create a bundle payment at Mayo Clinic for shoulder arthroplasty. One of the issues I struggle with the most is how to factor in something you mentioned in your presentation, the cost of complications. You mentioned the payment has to be responsible for avoidable complications, and I'm trying to figure out, we will have some infections, some rotator cuff failures. My two questions are, number one, what time frame do you feel the bundled payments should cover for complications? Is it one week, is it three months, is it a year? And second, how do you define complications that can be avoided or not. Thank you.

Bob: The first part of the answer is, unfortunately, this is more complicated than building Toyotas. People come in different ages, shapes, and sizes, so there's probably a baseline of complications even at places like Mayo Clinic. And I think you just have to say, currently it's a 4% rate of complications for this kind of surgery, we have to build that into the bundled payment. Now if you were able to get the complication rate to be less than 4%, because you come in below your previous year, you win; if you end up going up to 7%, you lose. You build into the bundle a baseline of complications that are consistent with both the risk mix of the patients, as well as the best practice we see today. We can't get to zero defects the way that Toyota can. Now tell me the second part?

Joaquin: Sorry, it was the length, do you think the bundles should cover one week, three months, one year?

Bob: You don't want a cost accounting professor from the Harvard Business School telling you this. You guys should work this out for yourselves. When Larry and JP and I tried to come up with a bundled payment for rotator cuff repairs for a private insurer in Boston, they were the ones who set the horizon (for complications). But I think we set it at six months. So, by six months, we pretty much know what's going on, if there was a complication. For other types of surgery, it might be three months, it might be longer, so again, you're the experts in this and you

should be the ones setting this. Now, the government doesn't have that flexibility. But if you go with a private employer, private insurance plan, then you should be proactive in specifying what you think the appropriate length should be to cover 95% of the complications that show up. Is that okay?

Joaquin: Yes, thank you very much.

Bob: So just go into your literature and your experiences, and that will tell you what the length of that bundle should be. Now you don't want to have a 180-day receivable from the payer. But what you can do, is get 90% of the payment up front, and the other 10% is held until that whole period has elapsed. So, when everything works out fine, you get the last 10% of the payment.

Derek: Thank you, Bob. So, with that, we are going to introduce our next speaker Dr. Andy Jawa from the Baptist at least for one more week until he becomes point guard for the Boston Celtics. And then we'll open it up for discussion and questions.

Andrew Jawa, MD

For Dr. Jawa's presentation (on vumedi.com) click here: Measuring the True Cost of Shoulder Arthroplasty: A Collaboration with Avant-Garde Healthcare

For Dr. Jawa's ppt (as pdf), click here.

Measuring the True Cost of Shoulder Arthroplasty: A Collaboration with Avant-Garde Healthcare

Transcript of Andy's presentation follows:

For those of you who don't know me, I'm Andy Jawa, I'm from Boston from the New England Baptist Hospital. I just want to take a few moments first to thank JP, for many things. A: as you all know for being the best educator you've ever had and throughout fellowship and your mentorship since then. I appreciate you being a thought leader, pushing all of us to think more broadly about shoulder and embracing other fields as he's done for me and others. And lastly, I appreciate you letting me teach your fellows, I've enjoyed that very much, so thank you very much for all of that.

Based on that, I'm going to be talking about the cost and value of shoulder arthroplasty, a fitting transition from Joaquin's questions. It's a collaboration with Avant-Garde and Derek Haas.

These are my disclosures and they're highly relevant because I speak for DJO, research for DJO, I design and have royalties from this company you've never heard of, and I have equity in an outpatient surgery center, for which I make money off of.

So, let's talk about this. In Dr. Porter's, Dr. Teisberg's, Dr. Kaplan's manifesto on value-based competition, they define time-driven activity-based costing as a gold standard for measuring cost as he described. The problem is that this requires expertise and resources. It is very difficult to do this on your own. It has been attempted, Mark Frankle who was many years ahead of his time in many things, did this almost four years ago after some of this came out. He made these process maps, he tried to do this with financial people. He came up with a good paper in preparation for BPCI. If you look at it, he did a good job, but the details are a little bit fuzzy, the methodology was not perfect, and it was not portable; he could not do it at different institutions. It wasn't on a technology platform it was quite limited.

So, the question is, how do I do this at my institution? And that's where Derek comes in. He founded Avant-Garde Health as a mentee of Dr. Porter and Dr. Kaplan, born out of Harvard Business School. Basically, he provides, with his company, the expertise, the technology, experience to come in, make those process maps, meet with your financial people, figure out how much an implant costs, and he provides you with real time live data that is incredibly powerful. So that's what we have at the Baptist and I'm going to talk about some of our experiences with that.

This is one of fifty different charts you can from the platform that I can get on my computer and look up right now. But, this is looking at cost for shoulder arthroplasty, and I'm on the left, so I do the most arthroplasties at the Baptist but there's three others who do that, and we can compare our cost. I am not the cheapest, even though I do an order of magnitude more than other people, but we'll dive into that a little bit more detail. You can see this big gray thing that is the main driver of cost, we'll talk about what that is. But you can compare, I real time, how much you cost. You can go line by line, you know is this dressing too expensive, you can figure it out, it's quite powerful. Even more powerful, and this is not from the Baptist, but this is a dashboard, you can see knees and hip, shoulder and elbow, foot and ankle, different DRGs, different time periods, different physicians, compare your complications, the cost of your hospital stay, length of stay. You can compare them to other people in the Avant-Garde cohort. You're blinded to how much they pay for implants. At the Baptist, for example, we think we're good, we think we're really good. It was pretty informative to find out that we're only in the 50th percentile of cost. We think we're at the top, at the 90th percentile, and we weren't there. That motivated us, and this is really valuable data. So, in hip and knees, they have 15, 16 people, and at the time of some of this data I'm going to show you, there were about four people in shoulder arthroplasty, now there are about five or six, so it's very powerful.

So, with this, we ask ourselves a couple of questions with this powerful data. One, what are the drivers of cost for shoulder arthroplasty? Is it the surgeon, is it the operating room, is it the nurses? Where does it cost money? I can't really tell you. The answer was quite surprising. Two, how do these costs compare to hip and knee, which is far more in magnitude in the US than shoulders for certain. How does it compare to elbow and ankle? Far less volume, is there a trend here, is there something we can learn from this? And lastly, how do these costs vary across high

volume shoulder arthroplasty institutions? Are we totally left field, are we comparable? What can we learn from each other?

The first question we asked, we were fortunate enough to get published in JBJS with JP as one of the authors and collaborators. We did time-driven activity-based costing based on this data and looked at high cost patients. Probably the most telling piece was this chart, and this is a little different than we expected. This is anatomic, this is reverse, and this in combined for 415 patients who had shoulder arthroplasty at the institution. This big blue represents a majority of the cost: the implant. I didn't think it would be that high, more than 50% of the cost. The next thing is personnel cost pre-op through the OR. The OR is expensive, this includes the surgeon, the anesthesiologist, the fellow, the circulator. That costs a lot of money. But it is nothing compared to implant cost. But the other thing that is really important is afterwards, 13%, 8%, 2% is pretty small, and that is the cost afterwards being on the floor. So, this is interesting, and it correlates with this next slide. Length of stay is what we focus on, it's important. It does cost money to be there another day, as opposed to most of our patients go home within 1-2 days, our average stay is about 1.4 days which is higher than many of you guys here. But, of course we've had some patients stay longer. But, the relative cost is not that much, about 20% or more less than your implant cost. Now let's look at our post-acute care costs, that came up. This is interesting, it is a chunk, 20%. We have about 10% of people go to skilled nursing facilities, higher than we want. There are people who have none who go to skilled nursing facilities, we're working on it. But still, it's 20%. For those people, it's a lot of money, but it's still it's much smaller, half, than the implant cost for total shoulder. This is what the paper was about and this is an interesting actionable data that we have not acted on yet, but we will. Who costs the most? It's women who are sicker, who interestingly have lower ASES scores, that's something we can work on in the pre-screening process, try to optimize them so their cost is lower. If you look at the JBJS American this month, they looked at length of stay for total knee replacement at Cleveland Clinic. It was women who had higher morbidities, lowest scores that had the longest length of stays, in addition to other things. So, this is considered consistent throughout the industry.

So, that led to the next question: how do these costs compare to hip, knee, ankle, and elbow arthroplasty at our institution? So, this is a paper that our current fellow Greg is working on. We've been fortunate because it's in revisions at JBJS and was accepted. We compared it to other arthroplasties and let me just explain this. This is all indexed to total knee which is at 100, so it doesn't add up to 100 for all of these. Total knees, highest volume, total elbows, 15, this was over a three-year period., there were about 15 total elbows done. And in terms of volume, you can see cost decreases. If you exclude total elbow, everything else on the right is about the same. The major difference in driver is implant cost. RSA is twice as much as TSA, more than twice as much, which is important in understanding the driver of cost. Now if you look at this, this makes sense; there are more total knee and total hips done in this country than total shoulder, maybe it should be more expensive. This is at the Baptist, I don't do any of it, but we do a lot more than the hoe. We did 10,000 total hips, 10,000 total knees, in that time frame we did 900 total shoulders, so it's an order of magnitude more, so the cost is going to be less, of course. But that's a correlation, not a causation. Then if you graph this implant cost versus total cost, it's completely linear, another point that implant cost is driving this.

Now, maybe this is just at the Baptist, we don't know. How does it look across other institutions? We did a multicenter collaboration with three others that use Avant-Garde. This is a little bit confounding because these are already institutions that are highly efficient, so it's maybe not the greatest cohort. But, I worked with Surena, a good friend of mine at Rothman Orthopedic Specialty Hospital and Matt Ramsey at Physicians Care Surgical Hospital, and Steve Klein at Gunderson and looked at our data. Now this was mediated by Derek because I can't know what their cost is for an implant. We analyzed the data and found that hospital volume does not impact cost. This is for shoulder arthroplasty, this may not affect everything else, but very interestingly, the blue is the indexed volume. Now, I don't know which hospital is which, but the cost is about the same. They are maybe on the lower side, but they are on the same cost as the next highest volume. Surgeon volume doesn't impact cost. Total cost is here, lower volume one to ten versus 100+. They're actually the highest cost, why? Probably because they're using more cutting-edge technology. It's really interesting, I don't know what to make of it, but surgeon volume does not impact cost, it has the opposite effect. Implant, implant, implant. Sixteen surgeons in these four institutions, it's a linear relationship. The most expensive implant led to the most expensive in-patient cost among these generally high-volume surgeons at these institutions.

So where does that leave us? How do we manage implant costs? Industry is our partner, we're very symbiotic, we design with them, so how do we make this work? I don't have any answers, this is just one thing we have at the Baptist, there's probably 30 other ways to do this. How do we figure this out? Co-management was something that was started at the Baptist about a year ago with the hip and knee line, shoulder has just come on to it. So, it's a collaboration of surgeons and administrators to manage a service line with the goal of improving quality and decreasing cost through financial incentives and transparent comparison. Surgeons have skin in the game, you can make more money if you decrease your own costs. It's like a bundled payment, internally. So, this is some of the metrics; I don't love it, it needs to be better, it's in its infancy. But, they have different percentages, citizenship: you must attend these monthly conferences looking at your data; manage your budget: that's 50%, you need to work together to decrease your cost. A bunch of process measures, like dictating your notes on time, patient experience, you're judged based on your HCAHPS scores, it should be ASES scores, patient satisfaction, we're working on it. Then, infection rates. So, what does this look like? This is an example of one of the HCAHPS scores that you get, and this is not blinded to us, we know who's here, there's always the same people on the left, there's always the same people on the right. It's already led to these discussions in or monthly meetings. How often do you round? One, twice, every other day? How much time do you spend with patients? It's embarrassing when you're on the right and your patients don't think of you as very good, and there's other scores that we look at. It's had an impact, it's changed people's behaviors. This is interesting; Op-notes, who really cares about Op-notes, but this used to be 60%, and when you're on the right, you're like "phew I don't want to be there." It's 100% now. So, there's nothing like competition to orthopedic surgeons to make you do better. Lastly, there's cost. These are all the joint gals and guys and there used to be outliers, and people don't want to be the costliest. So, they look at their line items and say, "I got to cut this out," but you want to maintain your quality, you don't want to sacrifice care. So, this has been very powerful. Lastly, there's something called reference pricing. Something was alluded to earlier saying "I'm only going to use Zimmer, and Zimmer is going to give me the best price, so that's all I'm going to use." So that's one way of doing that. With all the arthroplasties that we do, they came up with a more creative way of doing this in co-

management. We are all conflicted: we work with Stryker, we work with these people, how about we say, "this is the price and we have to come up with some way of doing that, the devil's in the details. Anybody can play if you meet this price." SO that's another way of doing it. Within one year, cost has come down pretty significantly, I can give you those numbers but it's a lot.

So, the conclusions here are, implants are the main driver of cost in shoulder arthroplasty at this moment. It's unaffected by relative surgeon or hospital volume for shoulder arthroplasty, that may not be true for proximal humerus or rotator cuff or other things, but for this it is. It's most correlated with disease burden, we have more hip and knee arthritis then shoulder arthritis. Co-management is one way to manage this, there are a lot of others, but we have to be creative and this meeting every month is what allows us to manage this service line to make decisions. How to we incorporate technology, what do we do for that? That's where we make our decisions. Thank you.

Derek: We're going to open up for questions, for Andy or for Bob as well.

JP Warner: I'll start it off. This is just a concern I have. How do we reconcile this with the work Larry (Higgins) and I did on volume versus value; and for that matter the views of Michael Porter's. There seems to be a correlation with volume and value, and yet you're saying that it (surgeon volume and experience) doesn't have anything to do with hospital costs. Also, Derek, I remember you gave me an analysis of the Mass General Hospital which analyzed resources/costs of four surgeons doing shoulder arthroplasty. This analyzed high volume and low volume surgeons and it was different than what Andy just showed. It appeared high volume surgeons used less resources and cost less than low volume. I'm having a hard time understanding Andy's conclusions, so maybe I misinterpreted what you gave me because this seems inconsistent with the data I looked at from MGH. How do we reconcile this to concept of volume versus value in the first place, I'm just confused.

Andy: I think it's very nuanced and it's going to be different in different surgeries. But in this case, where the implant is the main (cost) driver, it doesn't matter what dressing you use, it doesn't matter how long they stay in the hospital, because that is a minor percentage (of cost) relatively speaking; it (the prosthesis cost) takes over everything.

JP Warner: So, it would seem to me that we're really talking about the denominator (cost), not the numerator (outcome)?

Andy: Correct, but we're not very good at, with all due respect to value-based competition, we're not very good at measuring the numerator (outcome) right now.

JP: But there's a danger to just measuring the denominator. (We are talking about cost, not value.)

Andy: One hundred percent. And that's everything we have to talk about

Derek: Just to add, Bob and I are actually working on another article looking at the relationship between volume and value across a range of different kinds of orthopedic procedures, and in general there is a strong association, but I mean it depends on what we're looking at.

JP: But we have to be careful with this message, I think. Joaquin has a comment.

Joaquin: Andy, great presentation, I love the work that you're doing in general, and congrats on all the publications in JBJS. I think the problem with the question that JP had is you only selected high volume surgeons, so you're talking about Surena Namdari, Matt Ramsey and yourself.

Andy: Well, there were 16 surgeons in that (study).

Joaquin: But in this institution I bet that many of them operated more (shoulder replacements) than 50 a year, you know? So, there wasn't a compilation with truly low volume surgeons. So, I think the reason of the disparity may be the 16 surgeons are high-volume, because to be a shoulder arthroplasty high volume, you need more than 50 per year to be high volume, right?

Andy: I agree, it definitely could be, and that's why we need more comparisons. It's hard to do this work because people don't collaborate together and we don't have costing data for anybody, frankly. So, it's a start, but there are, in that data set, it wasn't just the main arthroplasty guys, there are sports people, there are other people who do one to ten arthroplasties a year in this study.

Larry Higgins: Andy, nice presentation, a quick question for you. Was any of this data in the collection period used in a way to prescribe behavior, (for example) were you posting your implant cost in this study? Or were you posting your performance, rather, compared to other institutions. Because the Hawthorne Effect is a potential confounding effect here, and I think that's a real concern. You already have a pretty significant selection bias for people who are already working with Derek and working with Bob, and so you have this incredibly motivated group of people already. So, I think administrative data sets, and Derek has done a lot of work looking at bigger data sets, maybe more valuable here, rather than saying "I'm having a hard time finding the value equation here because we're disconnected with the selection bias."

Andy: Yes, I agree, there's a selection bias. These are already institutions that- you don't go to Avant-Garde Health and spend money on them unless you want to know what your cost is, so your already high value. So, I agree, there's a selection bias, but you must start somewhere. In terms of data that we're publishing though, it's just sort of a cost comparison in a static time frame. Co-management actually started after this data set, so I don't think there's going to be that much of an effect. In that originally data set, TDABC, there was no co-management at that time, it was just sort of an observational study. But I agree, it is a confounded data set in that sense. But, there is one clear fact that seems to come out in all these sets: ***implant, implant, implant***. I don't know what that means, it's not the devil, but it's something we have to take into consideration. It's different from what I've always been told in residency, the cost within the operating room, your cost, the personnel cost, which didn't seem to be the case.

Bob Kaplan: Derek can I just say something here? One of the suggestions I would make, just to give some clarification, is something we did in our study, which is to separate personnel cost from supply cost. Sure, implants have the biggest component to cost, but let's just look at personnel costs, and see if we can see a volume effect. I would be surprised if we didn't see some type of volume effect, of course it gets back to JP's point, that where the low volume surgeons will show up is in higher rates of infections or complications, potentially. So, you would also want to look at that as well.

Jon Ticker: Andy, Jon Ticker from Long Island. I've learned a lot, so thank you very much. And I (also) had learned a lot when I took the course (Value-Based Healthcare) with Dr. Kaplan (and Michael Porter). I'm wondering if you've looked at each surgeon's risk patient profile, and did you measure that? And have you seen any change? Have some surgeons chosen to bring to surgery less risky patients? Is there any view that way, because I can see that being one of the potential outcomes?

Andy: So, we haven't looked at that; but, if I can make a broader statement about that, about cherry picking, which cherry-picking exists, and I'm sure exists in many of your practices. ASC's (for example) … people take younger patients to ASC's who have lower complications because you have skin in the game, you're an owner. So, this is cherry picking, right? So, I have an ASC ownership, and the average age (for shoulder arthroplasty) in the ASC is 55, while the average age for a total should in a hospital is 67. So, cherry picking exists but we did not look at that, per se, but that maybe answers that, that cherry picking does exist, and risk profile will change with this.

Derek: It's not a strong effect, but something we do actually observe is that there is an association with anti-causation, in terms of people with higher volume on average have slightly healthier patients than people who are lower volume, and that's basically using Medicare HCC risk scores. It's not a big effect, but there's a little effect. So, I know we're a few minutes past the time, does anybody else have any questions, for Andy or for Bob?

Jonathan Bravman: Thanks, yes, Andy, I have a question about the co-management strategy, and I guess the surgeon incentive to do that, to spend the time on this. If it's largely implant cost (that drives overall cost), is there anything that you're looking for, what is the ask, and what can you recommend to the group who don't have the strategy upon implementing it, is it funding research? What is your buy in, if the implant cost is so heavy to try to reduce these things on our end and what do you recommend to the group?

Andy: Yes, I've thought about this and I don't have a good answer, except if I can make a broad statement, that what Avant-Garde has done is to be a catalyst, to make us compare each surgeon to each other. That led us to just having a group, we call that co-management team. But just getting together with people who do what you do and comparing yourselves. Obviously, you have to have some skin in the game, money in it, or else people aren't going to act. What I think helps and makes people act and change their behavior is competition against your colleagues and knowing some data about your scores (clinical performance and cost). But also, just knowing and comparing yourself, saying "Look, we're going to take ownership for this line, and we're going to make our shoulder arthroplasties better." And maybe you can negotiate with your hospitals,

but I think it's first a mechanism for just making what you do better and showing them that you're doing that. Getting together every month and saying, "Where are we on this?" That's all I can suggest, I hope that will work.

Derek: Just before we wrap up here, one question for the group is building off of both Andy and Bob's presentations, how many people here are interesting in trying to implement any of these different concepts that they've been talking about? Just a show of hands. [≈3/4 of the group raised hands]
And roughly between these different things, if we break it down to measuring outcomes, who is particularly interested in doing that better? [≈3/4 of the group raised hands]
Then how about on the cost side? In terms of tracking and improving costs. [≈1/2 of group raised hands]
Then how about with the bundled payments? [≈1/4 of group raised hands]
It's a little bit less enthusiasm for that, but about equal for the first two, for cost and outcomes.
Alright, that's great. I want to conclude by thanking both Andy and Bob for their time and presentations. So, thank you so much for joining us today.

JP: Thank you, Bob, we're going to let you go now, we are very, very grateful for you giving your time so generously.

Bob: I hope it was helpful, it was great to interact with you and Larry and your colleagues there. You're the leading edge, we want you to keep pushing the envelope here for value-based healthcare.

JP: Thank you so much, I really appreciate it. Alright, so we're going to move on and I can think of nobody better to follow than Jimmy May. Some of you met him earlier. Jimmy is a former classmate of miner at Harvard Business School, and if I understand correctly, he's the head of the training for all the Navy SEALs on the West Coast here. If you're going to innovate, or have perseverance in what you do, it's nothing compared to people like him have to do. But, he can deliver a compelling message, I think, about innovating and difficult circumstances, and perseverance, and that's why I asked him to come here. So, keep an open mind, and think about how it might relate to your life and give some perspective on your trials and tribulations, and maybe this will be useful for you. So, Jimmy?

Commander Jimmy May

To see Jimmy's presentation on www.vumedi.com click here: Disruptive Innovation in the Navy: Lessons from the Battlefield

To access a link to a pdf of Jimmy's talk click here.


Disruptive Innovation in the Navy: Lessons from the Battlefield

Transcript of Jimmy's presentation follows:

Jimmy: Hi everybody, my name is Jimmy and I have spoken to three other groups before. One was some third to sixth grade hockey players, I'm serious. And then there was our store, some guys who developed the cloud. And then there was business school with JP, and you guys are the fourth. So, I'm active in the Navy SEALs, I have not spoken very much outside, so I don't have a very polished presentation. I'm humbled by the fact that JP thinks I might have something useful for you guys. You guys are way smarter than me. I'm definitely the low end on the totem pole of intelligence in this room. But please, I'm asking, I'm challenging you to guide my discussion to make it useful for you. So, I have a couple of slides in here, JP asked me to talk about leading organizational change. And I'll tell you, in my 18 years of SEAL teams, every legit change, that was useful in SEAL teams, was resisted like it was from the devil. I'm telling you, when I talk to JP about resistance in maybe your organization, I'm like, 'yeah we've seen a ton of it.' You're going to look at it and think 'this is stupid,' but seriously it happens. Reality is stranger than fiction. Once again, I'm asking you to please participate as we go through this. I have a bunch of slides, I'm not going to go through all of them. JP says I have 15-20 minutes, so JP, when you give me this (*gestures*) it means wrap it up, okay.

So, I tried speaking to the SEAL teams, I didn't want to do it. They were, like we want you to teach combat leadership. And I'm like, you know what, I'm not very successful in combat. I've had more people die under my charge than most folks and it's a painful thing, I'm not the right guy. So, I decided to make it nothing about things I've screwed up. People love to hear that, and so now I've been doing that for five or six years. It's been a cathartic thing for me, honestly. I think it helped me get over a lot of my issues from before. Anyway, that was about the ineffective sabotage.

New ideas. Especially new ones. Why are they so threatening? I'm interested. Who here, we've got some psychologists and intelligent people, why are new ideas threatening? Somebody, please.

- Change is hard and can be very expensive

- Threat to the people who have the old ideas
- Egos are involved

That's huge and I'll tell you what, there's no place for bigger egos than the (Navy) SEAL teams. You can't even fit them in this room to be completely honest. So, I have a couple things up here. I know you guys can read. I'll skip through that. But those are the biggest things, honestly. You guys kind of hit them. So, I'll go do some examples: GPS- We have what's called the three rules to be a Frogman. ***Number One***: ***Be cool***. ***Number 2: Don't get lost***. And ***Number 3 is: If you get lost, just be cool.*** And so, when I came to the SEAL teams in 2001, GPS was this new thing. Now we all have it in our cars, it's on our phone, it's like you're just like, 'Hey Siri, how do I get to the Hilton today,' and it tells you. Back in the day it wasn't like that, it was you know, this big scary thing, and the older operators were like ' you know, you've got to learn map and compass because electronics are going to fail when they get wet, it's not going to work, and so we all believe that and they were like 'I don't want to learn this GPS. Hey, new guy, learn this GPS.' And so, I had to learn the GPS. And it sounds like not that big a deal, but back then I had to plug it in and would mess it all up. I was the guy that had to figure it all out, as the new guy. And I ended up being the point man for a security detail. So, in my first deployment I had to protect the Deputy Prime Minister of Iraq, (an) amazing dude. I speak Arabic now. I didn't at the time. We drove him around in Baghdad, and you cannot get lost. Because the more you drive on the streets, the bigger your chance of getting blown up. I've been blown up multiple times, it's not a savory experience, and I think that it is an important job, but I had to do it (use GPS) because I was the only guy that got made to do it. The old guys hated it, and that was stupid, you know we go on deployment and that's the only way you can navigate because there are no street signs, everything's dirt. It (GPS) was a new innovation but you guys right now are probably like 'that's stupid, why would you not use GPS?' At the time, it was a huge deal.

Night vision. Who here can imagine special forces without night vision? Probably nobody. Who said expensive to institute? Was it you? So, night vision, there is more to it than just putting something on your face. Basically, all your weapons have got to have lasers because you can't focus near and far with night vision. I can't hold that thing to my face, so I'll hold it from my hip, and I'll have a laser, but that laser has to be sighted in, you have to be able to drive on it, walking on it is difficult. If I put you guys in night vision right now, you'd have a hard time walking. It's a huge advantage once you learn all these things, but at the time it was a big deal, and everyone was vehemently against it. So, I was with SEAL team two, and the commander of the SEAL team two is a three-star admiral now. Amazing guy, black belt in jujitsu. There are not a lot of admirals that can beat my ass, but he can. And he was very forward thinking, and he said 'hey, from sunset to sunrise, you guys are all on night vision.' And the older guys, you would have thought he just, you know, it was the new blasphemy is what I called it. And our first training trip, we had a guy named Mario Maestas, and I'm a brand-new guy, that's who I am at the time, a new guy, and we're on night vision and the old guy is like 'this is stupid, why would you do night vision. We do these pop flare things in Vietnam where it makes this light so now you can see the enemy.' But guess what, he can see you too. And so, guys are really against it, and the first trip we went on was in Fort Chaffee, and one of my best friends at the time, Mario, and I have an immediate action bill. If I use an acronym that you don't understand, you have permission to throw something at me. Trying to get used to talking to civilians, and this is part of it.

So, an ***IAD*** is actually when you get shot at, and the first thing you do is, what is your immediate action, usually it's like you break into two squads and you start shooting and you maneuver while streaming live ammunition. We train with this live, it's a pretty dangerous thing. So, the first day we ever trained with night vision, one of my best friends, Mario, got shot in the back of the head and died. The bullet went behind his head, came out right above his left eyebrow, and it was a big deal. I've never seen a body killed violently before. I was 24, and I remember they were like, "Hey new guy, go clean up the back of the van." It just so happened it was in brain matter in the back of the van. I had a piece of cardboard, so I scraped it, and I felt like I should do something with this more sacred, but I just had to throw it away. I remember that was just a bad feeling, like f*ck what do I do with this. So of course, they made this big deal, "You can't do night vision." Well, he (the Admiral) stuck to his guns despite there being voices saying it was too dangerous and that he can't do it, and he did it. Now three years later I'm in Ramadi in 2006 and we're doing day time operations, and the whole special forces community is furious saying, "What are you operating in the day for?" because we have such an advantage at night, it was just a hard transition for us to make. It was painful, we lost a couple badass dudes trying to figure it out, but once we did, it was worth it. In my heart I know we saved lives on the back side of that. It was a hard thing going to tell Mario's family that Mario died in training, that's a painful thing; because the family doesn't want to hear that he died in training. They want to hear he died in a more meaningful way. Anyway, I don't know where I'm going with that but it's a difficult conversation to have. Point is, transitions are painful, but now, it's so worth it to operate like this. I put night vision on, my gun is set up, they won't even attack us at night because it's such a joke. You sit next to you guys and you know who is going to shoot who, and you're like "Are you ready?" *gun sound effect* and they all fall, it's a smooth beautiful thing now.

Just making sure I didn't miss anything. Oh, the self-identification thing. This is interesting, this is a reoccurring theme. Who said ego? You did. I think self-identification, I learned this in business school talking with one of our instructors and he said, "These guys who don't want to embrace this technology is because who they are is this guy who comes up and stands in the face of the enemy, and all of a sudden they feel a little cowardly. It's not cowardly to live, and it's not cowardly to do new things that disrupted the whole game. Now at night, we own the night, and we still do. Even countries that have night vision, they may be able to see us, but they don't know how to match the optics up to it. They don't know how to incorporate those optics up to helicopters, it's such a joke. I just tell the helicopter tell it where I want it to land, tell it where I want it to shoot, it's easy. It's such an amazing advantage, we could have lost if we didn't have a leader as clairvoyant in that way. I'm going to stop there, does anybody have any questions?

J.P.: Jimmy, I think these are compelling stories, but we can each reach back into our own experiences. Even though we aren't in the same life or death situations as you, sometimes your emotions make things fight or flight, even though it's not truly a fight or flight issue. It's a discussion about how I really believe this is going to help my patient and you have to deal with people around the table when you negotiate with people who are motivated by other things, many of which you suggested. What you didn't talk about and what you don't see, I don't know how much it has to do with the Navy, is actually the cost of the change. All change requires some degree of cost, I think. If you decide to change your supply chain or decide to change something that will have a benefit, you have to put some resources (cost and personnel) into it.

Now it may be emotional cost, or it may be real cost. So, there is some extrapolation here that I can make, because there's a real barrier to change because it involves cost on those levels. I can understand how this would be relevant to everyone here who believes something should be done when your institution believes otherwise. That's a problem, it's a little bit on how to manage yourself in that situation and persevere, like you were describing.

Jimmy: It wasn't me who persevered, it was my boss, and I thank god he did because things are a lot better now. I can't take credit for his clairvoyance in that realm.

Let's see what I got next. Oh CQC: ***CQC is close quarters combat*** and this is where we take down a room. If guys are going to bust into this room, there's a certain choreographed way they'd do it. The first guy would go one way, the second guy would go another way, the next two guys who come in they present their weapon. It's super tight, in fact we're graded on it and it's a selection criterion in the SEAL teams. So, if I come in and I present my weapon too close to him, then I get a safety violation. One or two and you're out. It's high stakes, it's not politically correct but I'm not polished yet I told you guys, it's special forces not special Olympics where everybody gets to play. They're gone.

JP: That was really politically correct, I liked it.

Jimmy: HR is called hostage rescue, which is what we do when we have a hostage involved. Which is basically like get through the house as fast as you can, and it's pretty dangerous for us because we're busting through doors, we're moving quickly. We're not stopping, we're running quickly until we get the hostage. Once we get the hostage we slow back down. But at the time, we didn't use a lot of special forces when I first came into this. So that was the way we did everything.

Ramadi 2005 I started getting shot at a lot, and I actually got hit a time or two. A lot of my friends did too. On my task unit at the time we had 32 guys, 16 purple hearts and 3 killed, so it was a pretty kinetic environment. We, on our own accord, instead of running into a room, we would kind of stop at the door frame and look and switch the shoulder to this side, so you don't have to stick your head out there too far. I don't know what we called it, we just did it. I come back from my next workup, and they've got this new thing called combat clearance, you clear from the door frame, and I was like "Oh I invented that, all it took was getting shot at a few times." But some of the older guys thought it was stupid, it's all about the big boom and you run into the room, and those guys haven't been shot at as much as the younger guys. It was like a blasphemy. Now enter the world we have today, IEDs and booby traps, you walk into a room, you trip on a wire, you put light on photocells and that thing blows up. We've hit multiple HBIEDs, which is a house borne IED where the whole house blows up, that's a catastrophic event. Your whole platoon can die when the house falls on them. So, we had to slow things down and the guys resisted it, but it was the right answer. To this day, even in hostage rescue, once we find the hostage we slow back down. It's like "we're going to HR guys" to which guys are like "phew alright we're going to HR," that means be ready, get your place forward so you don't get shot from the side until you find that person. Once you find that person, it goes "hey slow down we're going deliberate," that's what it's called. Dynamic deliberate. It's another one of those things that we started doing. The next step was this thing called "The Call Out." Guys wanted to go into a house like "hey are we going into this house?" but if there's not a hostage in there why would I even go in the house? Why don't I sit outside and cover and call them out, and make them come out? Even if they just send the women and children out, it's a better environment, it's easier for me not to kill the people I'm not supposed to. So, the call out was resisted too. It was one of those self-identity things with the ego that we talked about. Guys just want to be this brave warrior that just goes in, and it's actually not as fun as you think it is after you get shot at a time or two. The point is, the evolution of tactics happened, and it was resisted. Now, it's just common place and I cannot imagine doing it any other way.

Any questions from anybody? About this or anything else.

Danny Goel: So, thank you very much for this. So, there are several themes that are consistent with everything that you've introduced. Persistence can only get you so far in the military, what are the levers that are allowing these innovations to be introduced because you can only have a person or a group of people banging their heads together for so long saying "we need to introduce this," what are the levers that are helping innovations like those get introduced to the military?

Jimmy: I like that question, I have my own opinion, I don't know what's right or wrong, so if someone has a better answer let me know. What I think it is, is most innovations are not done by the older guys. It's done by the new guys who are trying something new, and they're more familiar with technology than us, which is fair, and they have a better way of doing things. ***What***

it takes is a higher-level leader who is humble enough to open himself up (to the possibility of something being better). So, the first speaker that came in, that was talking on the video today, he said the surgeon wasn't being as effective and he decided to go ahead and talk to junior surgeons, which is an amazingly humble act. Humility is something I struggle with too. But that's what it takes. It takes a leader who is humble enough to listen when your new guys have innovations, because innovations don't come from us gray-haired guys. I'm not that old, I'm a 42-year-old Navy SEAL, but I'm at the end of my rope. But these young guys coming in, they're smarter, younger, faster, and me recognizing that so that I can empower them and create methods and procedure so that they can descend, and then listening to them in a real way. It takes a procedure; you guys are all top in your field, you guys have a voice and can create procedures and processes to do this, and that's what I try to do now. I run all training for Western SEAL teams. I try to present a way for these guys to get their ideas in the pipeline, does that answer your question?

JP: Jimmy, can I just comment? I think you just alluded to something, but you didn't say it. There are really two things that help you persevere in these situations: one is mentorship, you become a mentor, and somewhere along the line that helped you. I sent out something to Codman about how to be a great leader, and emotional intelligence isn't just abstract, it's real. You work much better when you work with somebody, and having a mentor who has perspective, and also isn't ego centric, which means you have to pick your mentors really carefully. This is important in the battlefield, or trying to innovate in the navy, or whatever you're doing in the hospital. The other thing that's really useful, that I think about a lot, and I'll talk about in terms of disruptive innovation and who does it and how you do it, is partnership. You do far better when you have collaborators, especially close collaborators, because you are greater than the sum of each individually. You're just a voice in the wilderness by yourself. So, strategizing together and executing together, I'm sure this happens in the armed services in the things you do, enhance your likelihood of being successful in whatever endeavor you're undertaking. Most of us grow up in a pyramid system, we think we're at the top of our game, but reality is, we grow up competing against one another to get to the top. Each time we have to compete to get to the next level, teamwork isn't part of that proposition, so you're growing this rugged individualistic kind of attitude, whether you're talking about collaborating in healthcare to create integrated practice units, or succeeding on the battlefield, or whatever you're doing. That is an attribute that some of us have developed more than others. I can tell you, the latter part of my career it's been something that I'm trying to recognize and work on more, and that's a work in progress. So that's what I see as your message here, those two things; shorten your learning curve, and keeping yourself sane to get through the people who are making your life difficult.

Jimmy: Any other comments from the crowd?

Jon Ticker: Thanks again for speaking to us; and thanks for bringing up Mario. It helps me get some perspective, and I think to add also to what JP is saying, at least what I strive for in the operating room, and I'm sure you strive, is to identify variables and reduce or eliminate variables the best that you can, because a circumstantial environment will always have some variables. But the more reproducible you can get, if you have a pattern of entry, then that's no longer a variable, and that has helped me, but I think that's in part what you're saying. Does that resonate?

Jimmy: I think it does. We call it risk and risk mitigation. Everything we do is risk to mission or risk to force. Some missions are unfortunately more important than a couple of us, and we try to mitigate those risks. It's our job as leaders to find those levels of risk, those bottlenecks in the operation, and then enact procedures, a lot of time for me it's assets. If I see that this is a really dangerous part of the operation, maybe I'll bring in more assets, an AC-130 or some aircraft, some other way to mitigate the risk to tip the hand back in our favor, am I capturing what you're saying Jon? Anything else?

Audience Member: Hi, question: There have been some examples in orthopedics of disruptive innovations that have been a mistake in the end, do you have any examples that you've seen in the military, or any insight as to how you identify those more quickly, or saying that we're going to make X number of mistakes disrupting?

Jimmy: You know, you have to be open to mistakes and you have to encourage innovation, but to a point, and I think my ending slide, of course you guys would figure out the ending before it gets here. You have to encourage that type of failure, and it's hard, because someone is going to screw up and feel bad, but you've got to say that you appreciate the chance they took and the risk you took, but it has to be a calculated risk. So, us as leaders have to see that risk they want to take, then my experience I put on top of that and I weigh how to mitigate that risk, and if it's too dangerous, I can't let them take it. But you have to encourage that descent. You know, it's an example I have at the end, but I'll talk about it right now. In Afghanistan, I was a troop commander back in 2012, it was my seventh deployment, so I had a lot of combat experience. We had a great operation, in my opinion it was a great op, I thought we had the bad guy on his heels, we sucked him in. Just long story short, we were driving down to this area where the enemy was being held for a long time, gun fight sparked up on the right, we pushed an element out to gauge them, to keep them where they're at, they were in this ditch. Then we had a gun fight spark up on the left, push them out there, they're in it. I'm like, "alright, let's keep going, keep pushing down the middle, we already found three HBIEDs. We pushed them over with a remote-control tractor, they blew up, we found 19 IEDs on that op. At the end, we're getting ready to go into this thing, it was a huge success, none of us killed. The enemy were attacking us, the helicopters are coming in, and I'm like, "Hey get these helicopters out of here," my thought was let's suck these enemies all the way in, and when they're all the way in we're going to blow them up. It worked out really well, we pushed the helicopters off, brought them back in, we made martyrs out of a lot of the bad guys. It was a really good op from my perspective. So we go back to the hot wash, where our rank comes off and we talk about what just happened, and I thought it was going to be a big high five session; none of us got hit, all of them got hit, and it was awesome, we took this whole highway we were trying to get for a long time. Then a junior guy, his first platoon, he puts his hand up. He says, "Hey man, you kind of sent the helicopters away, we were taking overwhelming fire, I don't appreciate you being that flipping (casual) with our lives." How do you react to that? Somebody?

JP: You're being criticized by a brand-new guy, you're the expert, right?

Jon Ticker: Communicate with them, explain to them what you want, make it a teachable moment.

Jimmy: You're not a little bit mad? You're not like, dude, take it easy? So, I'm going to tell you, I was super proud of this young man for putting his hand up and saying something to me. But it would have been very easy for me to crush that culture and say "Hey, dude, shut up. Guess what? I'm the troop commander." I have the monopoly on saying what's right, and I know that. His name was Matt Bitter, amazing dude. He got out of the military and now he's running a hotel in Boston. I went up to Boston and tried to call him, he didn't answer my call. But I will tell you he's going to be in town this month and he called me to tell me he's coming to San Diego. So, he was in the platoon leader's course where I speak, and I used to teach this to the team guys, and I'd be like "Well guess what? I told them all that I have dual-com so I knew what was going on, I had the helicopters on a short string, I could bring them in, and we could take care of these guys, I was ready. I used to teach it like afterwards he understood, and it went over well. Well, years later, he was a platoon leader himself and he was in the course, and I said, "Hey Matt, why don't you say what happened?" He stood up and his story was much different than mine. He's like, "We were pinned down, were taking over all the gun fire, the air is sizzling, thank god the helicopters are coming, then I hear Jimmy come on the radio saying, 'Get the helicopters out of here.'" And I look at him, I'm in front of the whole crowd, and I'm like, "Yes, I know but afterwards I explained to you what happened, and you understood right?" Awkward silence… It worked out and he sat down… So, the point is that the culture of the troop was healthy enough and I had the awareness at the time to not crush it, and he was a great officer. He still doesn't believe in my calls that day, maybe he thought I was a little bit aggressive, but I will say that it worked out well for us and it was a healthy dialogue, and I'm grateful for him and the atmosphere that his chief and officer in charge that run the platoon, I'm the troop commander, I have four platoons. So, I'm grateful for the environment that they foster where they had a young man who would stand up to me and say that, because when I flew in, I was significantly higher ranking than he is, probably like you guys and having an intern. So, you said you'd want to crush him publicly? I don't know, I'm not in your field, but at least in my organization it's healthy to not do that.

From the beginning I had really strong officers and really strong chiefs, but I never had a monopoly on what was right, never. Whenever they had something to say, whatever my experience was, I tried to listen to it and I tried to give it credence and explain through my experience why I didn't think it was right, but I would never take the hardline and tell them that's wrong. I am an egomaniac and it's really hard for me to swallow that, at the very end I'll tell you one of the things that help me recognize that bias.

The other thing you can do is put some processes in place. When you're not emotionally charged about something, maybe it's as simple as putting it in an anonymous box and putting a suggestion in, or maybe it's an app where you can write anonymously and get back to me. Me, personally, I do 360 evaluations up and down. It's three open ended questions: what am I doing right, what am I doing wrong, what would you do if you were in my shoes? I do it six months after I get to a command, I do it right before I leave, and I ask people that don't like me. It's anonymous, there's a survey monkey you can do, or you can have it sent to your assistant, you guys all have assistants probably, and have your assistant anonymize it and get your feedback. I think that's been a powerful tool for me. JP how am I doing on time?

JP: You're doing fine, maybe another ten minutes or so, I'll have everyone go out and get some dinner and take a few minutes and come back in so we can keep going with the program.

Jimmy: Okay. A2E and A3E. It's called advise and assist, A2, and E is enable, and A3 is advise, assist, accompany, and enable. That's the way we did business in Mosul the last time around. So, I was deployed… anybody hear about the big Mosul fight that happened? It was a legit fight, entrenched enemy, we were not allowed to accompany our partner force. So basically, we were one kilometer off the flot which means forward line of troops, and the new way of doing business was, like, you had these super tech-enabled guys, you've got this big, giant, metal car and it's got the feeds from the ISR, which stands for intelligence surveillance reconnaissance, but it means basically that all the predators and all the things overhead, they're sending imagery back to your little truck and you've got an overlay of where the forces are. You can see where they're moving, and you can direct fire in support of your partner forces. I haven't been on an op in a while. I'm stoked for this op. I was the deputy commander of all the special operations forces in Iraq at the time, so I had 1400 people under me, 11 different nations. I flew out, I was like, I'm going to go check this A3 thing out, and it was boring, I'm like, this is stupid. We're just sitting

in a truck watching feeds sending aircraft and this is dumb. I soured on it. What ended up happening was I caught myself being that old guy that doesn't want to change, that's who I am, because it's super safe, the guys are way back, nobody gets killed, and we accomplished the mission and it was a good way of doing business. But I didn't like it. I felt like we should be out there doing our own thing. It was a difficult pill for me to swallow. Here I am, the guy thinking about his glory days, kicking in doors and doing cool shit thinking that this is not nearly as cool. The point is, the new technology came in, who was the resistor? This guy (me). But it was the right answer. I'm really grateful we brought almost all of those guys back. Very few of our guys got killed, and it was a nasty war. A lot of VBIEDs, seeking missiles, they just armor up these things and it looks like a Mad Max vehicle and just drive right into you and blow themselves up. Chlorine gas was flying all over the place, it was pretty nasty tactics that they used. But this A2E/A3E principle was really useful.

The last thing I want to talk to you guys about was, and we'll get back to the point, my best friend was killed August 6th, 2011. His name was John Tumelson and he was a complete stud. He was like, 6'4", good looking. When we set up his funeral, I had a whole section just for girls who thought they were his girlfriends. They come in like "Hey, I'm JT's girlfriend," and I'm like go sit with the other ones over there. But he was a stud. I got called into the command, fly out to Iowa, six hours later I had to tell his dad that JT was killed, but that's not the hard part. So, I just got back from deployment myself, I had to get a surgery, I was a little dinged up. So, I went, made a notification, his dad, George walked up to the door, and said "I've been expecting you." I don't know how he knew but he knew. So, I made the notification, left a day earlier, two other folks came out with me to plan the funeral. They're good people, they're awesome people. I didn't know them before then. But they sat down in this town of 700 people, we had a 1500-person funeral to plan. We had churches that were going to come out and protest a soldier's death, which is terrible to me. I don't know, some people that's what they do. Then they had this biker gang that was going to come in front of the churches with their flags and rev their motorcycles so we couldn't hear the protests. The governor of Iowa was coming out. We had cats and dogs of every variation you could imagine. And I had to fly home and get my surgery. So, I came back three days later after my surgery on a plane. Doc's like, "Hey, don't fly," something about a blot clot or something, and I was like, "Negative, I'm flying just give me some drugs." So, I landed, I get back and I'm looking through the excel spreadsheet that has your job (listed for the funeral). I figure I'm probably speaking at the funeral. I'm the best friend, you know? Probably a pallbearer. I'm probably escorting the mom to her chair, holding a flag, what am I doing. So, I'm looking… check, check, check. My job was to handle the DVs. DVs are the distinguished visitors. And I am getting mad. I'm looking at it and I'm like, "It's in his will, I know it is. I'm a pallbearer. I know it. I'm a talker. I know that. I made the notification." Half was through this ego centric soliloquy I can hear all the eyes and I'm like, "Oh my God," the job here is to honor JT's death and that's what I should be doing. I was really ashamed of what I was doing. I was ashamed of myself for being that way. It was a painful thing, so I shut my mouth and handled the DVs, and I did a good job doing that.

The pallbearer didn't drop him. The person that spoke did a better job than I could have. The person that escorted his mom took her to the right seat. All that stuff happened, and I was the issue. That was JT's parting gift to me, was to teach me about getting over myself. So, we talk about ego getting in the way, that was something that I learned from my best friend JT, and it was his parting gift to me. I'd rather have him here, but I appreciate that from him.

With that, I'll open up to any questions before I go.

Charles "Chuck" Smark: Have you talked to other senior Naval officers about ego management. When you have 18 years of experience and you've got a new guy telling you his opinion, do you talk to each other about how to manage what the young guy said to you, not as a criticism to you, something you need to break down, in terms of what's right and what's wrong in what he's saying to you, educating him. What do you guys talk about?

Jimmy: So, what I do is I teach combat leadership, so every chief or OIC that takes over a platoon from the east coast and west coast, there's not that many SEALs out there, you're more likely to know a pro-baseball player or football player. At any time, there's only 16 chiefs and OICs, there are sets of them. So, I talk to them every year and I give them that talk. This is what I do, I can't tell you institution wide, it's an area we're lacking is ego management. But, I talk to them about putting in processes to make sure while you're not in that emotionally inflated state, putting in processes to manage yourself and provide opportunities for feedback that's not going to offend you. It's different for everybody. Maybe you can handle the JO (Junior Officer) calling you out. Maybe you can't. Maybe you need someone to send on their app anonymously. But whatever that is, you need to figure out what works for you, and do something, whatever that is. Procedures are good because it holds you accountable to yourself even when your emotions are higher. Which what you guys do is dangerous as hell, cutting into people and doing stuff, I can see that being a pretty intense environment. Did that answer your question?

Chuck Smark: I've found that managing a team is different from managing an individual. it's easier to speak to the JO individually about managing their own, but when you're looking across the whole board with the senior folks, what ideas do you have about sending that culture so it's more pervasive, so it's involving all the guys at your level of leadership, as opposed to mentoring the one JO and hoping it spreads.

Jimmy: Well I think it's kind of like speaking. You talk to someone or you talk to no one. As you get higher up, well you guys are all high up, people are watching you that you don't even know. I'll say something stupid in a brief and years later and this kid is like, "I remember you said this thing!" And I'm like, "That is NOT what I wanted you to get out of that." So, when you take that time for the individuals and the individual interaction, he's not going to keep it to himself. Your reputation will spread. I believe in managing individuals not a group, and I think that spread through the group, does that make sense?

JP: That was just great, I'll give you guys a little bit of a break. There's dinner outside, take 5-10 minutes to settle, then come back in here and we'll keep going on.

Jon JP Warner, MD

For Dr. Warner's presentation on www.vumedi.com click here: Disruptive Innovation and Ambidexterity in an Academic Medical Center: Lessons from Harvard Business School

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Disruptive Innovation and Ambidexterity in an Academic Medical Center: Lessons from Harvard Business School

Transcript of JP's presentation follows:

JP Warner: So, I'm going to follow up with my sort of mundane attempt to follow Jimmy, it's going to be a little difficult, but I wanted to talk a bit about disruptive innovation, which is kind of a catch term; it's not necessarily the best term to use here. So, this is theoretically something I'm trying to share with you, I learned it at Harvard Business School, but I also learned it a lot from people like Jimmy.

Before I forget, anybody who wants to communicate to Jimmy, do a shout out, just send me an email and I'll send it on to him, because I think it's good to have feedback. I promised we would give our feedback to him.

So, I call this innovating value, and we've been talking about value, and part of the trepidation is we're worried, most of us, the value being captured by someone other than us for all our good work. This is some work I did with Larry Higgins a while back. I really believe in what I do and where I'm doing it. Codman was 100 years ago, but Porter is probably the next closest thing I know to Codman. So, this is 100 years of value, we've heard about that. Einstein said, "I have no special talents, I am just passionately curious." That would probably be my explanation for what I'm going to show you here.

Now value is very personal, this is me in 1984 when I fell off of a mountain. In those days, they treated my shoulder instability with an open incision and Spica cast. Yes, that's a Spica cast. A half body Spica cast in the middle of July in Boston. In my job where I was a resident at the time, I was given two weeks off and I got to go back to work in my Spica cast. Now the question is, what is the value for me in that? I would have been a lot happier if someone innovated sooner so I didn't have to wear the goddamn Spica cast. But the reality is, that was my interpretation of value, I just didn't know it at the time.

This is from Larry and I love this slide, this image that Larry gave me, and I've used repeatedly. When you talk about value, the patient's got one idea, the government's got another

idea, and the insurers got a totally different idea, and then finally you've got your idea; it's outcome and its income. The reality is, when you look at the fortune cookie that says, "That wasn't chicken", and the problem's alignment. So, when Andy presents what he presented here, I don't know how many of you sort of feel anxious about what does it mean for me? We got our industry colleagues here, and the last thing we really want to instigate is a price war, because then nobody benefits from this situation and innovation goes out the window. So how do we get alignment here and try to deliver value and make sure all boats float, and the system absolutely doesn't allow it at the current time. Clayton Christensen, who I haven't had the pleasure to meet, but is a brilliant thinker at HBS, wrote an article about disruptive innovation and the potential for it to cure healthcare. Then one of my professors at HBS, Regina Herzlinger, wrote about why it's so hard to innovate in healthcare and she wrote this great book for anyone who's interested entitled, "Who Killed Healthcare", which is sort of a diagnostic exposé on the problem with healthcare in the United States pre-Obama care. Obama Care, one might argue, made it worse, and there are some other books about this as well. Then Michael Porter partnered with Bob Kaplan to blend strategy and finance together to write an article about the cost crisis and how to solve it. But the problem when I read this is that "I always feel like I'm going to come out on the short end of the stick." It's very hard to motivate people to give away the value they would otherwise capture, and I'm still having trouble, even though it's a noble thing to do, how am I going to do that for my patients. Now this is the funniest one I saw in HBR Blog Network, "The happiest people pursue the most difficult problems". That's probably most of us sitting around this table, including dealing with the reality that Andy just reported to us. And try to think about how we're going to refract that into survival in terms of our own professional lives and incomes.

This is a good paper written by Regina Herzlinger and basically, I took a program at HBS on innovations in healthcare and it was me and mostly venture capitalists, and she pointed out several very important things other than its hard work. The first is that to be successful, any innovation must be profitable. So, if you drive all the profit out of it, it's over; there's no innovation, everything dries up. But true innovations reduce cost and have advocates. You have to find advocates to support what you're doing, and maybe the answer to this is changing to more margin driven rather than revenue driven approaches. I don't know, but it's just a thought. There are six factors that affect an innovation. The first thing to do is recognize is it technological? Is it an integrator where you're taking things together and making something better because of all of the things you put together? Which is really the most powerful. Or is it a consumer innovation like the way you deliver care? I met with someone this morning that was really trying to create a consumer innovation in terms of aftercare following surgery.

So, let's look at these six factors. Structure is nothing more than friend vs. foe. In the environment that you are, who's the bigger enemy? Who's going to be more of an impedance? There is no question that you could innovate in California something different than you could do in Massachusetts because of the structure of ASCs for example. So one of the reasons you might succeed or fail has to do with where you endeavor to make a change, and I guarantee to you, and I'll bet you anything that Larry and his company have a strategy when they look at where the opportunities exist and focus on those opportunities rather than go to the most difficult market and try to leverage those successes in more difficult markets. That's the first thing.

The second thing is public policy. This is a local, national, and institutional rule and climate and allows you to institute what you want to do, that's not a minor issue. So many innovations start without any sensitivity to this at all. It's not part of the proforma necessarily. The proforma can be entirely unrealistic if it doesn't recognize these barriers.

Then who is paying for it? What's your financing structure? You don't just make something out of thin air. Every company must be willing to lose money to make money, whether they're a start-up or a multi-billion-dollar corporation.

Technology we've got pretty much solved. Technology is not an excuse any more. Except for the regulatory barriers about technologies like, for example, virtual visits or telemedicine, which will really lower the cost of care, but has a major barrier in terms of friend and foe and regulatory.

How about consumers? Who's your customer? Who's paying? Is it the patient, the insurer, the government, the hospital? The idea of who the consumer is changing a lot. Doctors now are becoming more influencers than customers in some markets. So how much we leverage our position to allow new technology and deal with this price pressure is really critical in thinking about a new venture.

Then what's your accountability? Your alignment and your transparency in how you do what you're doing.

This is from Christensen's book, or his article, and basically some examples he gave were low intensity portable x-ray machines that had the cost of 10% less than large machines. Physician owned hospitals which are now outlawed, which are half the price of non-physician owned hospitals. And cheaper, simpler, effective alternatives. Most of these are blocked by those who benefit from structure that allows them to capture value. It's not a minor issue; it's a big deal. If you look at academic medical centers, they promote expensive technology and can't run efficient, lean businesses. Outpatient surgi-centers, specialty care facilities are most cost-effective. What's been the impedance depends a lot on where you work and who your collaborator is. This is a quote from his (Christensen's) article: ***"Instead of working to enable the natural upmarket migration that is an intrinsic part of economic progress, today's managed care organizations, insurers, and regulators have done just the opposite. Highly trained physicians are forced to down-market to diagnose simple and less complex problems."*** For example, then we become charge capture instruments for EPIC. Well you just heard about cost capacity rate, this is the antithesis of what Bob Kaplan was talking about in wasting our time and the hospital is capturing all the value, and they're basically using us to do that. The question is, will artificial intelligence help this in terms of the way we spend our time entering data, etc.? Or will our physician support staff help us? And regulatory affects that too. In some places, physician assistants drive revenue, they're revenue positive, or margin positive, in other places that's not the case. This depends on what state you work in, and I'm in one of the states where it's a challenge. So, these are structural barriers to innovating on many levels.

This is an old slide but it's kind of impressive; academic medical centers have higher costs. Where you work affects the value you deliver and no matter how high I try, I can't impact the cost structure that's inherent to where I work. To the degree that I can have leverage delivering value no matter how low my charges are, no matter how much a improve what I do, whereas I could do it somewhere else. Frankly, companies have to make a decision, where are they likely to drive the best proposition for their business relative to the price pressures of the inefficiencies the organizations to whom they sell.

This is an article that Derek Haas, Mike Jellinek and Bob Kaplan wrote about budget systems holding back hospitals, how they're inherently structured in a way that doesn't allow for innovation. This is a quote: ***"800 Digital health startups were funded in 2017… while 75% of senior hospital executives have been notoriously slow to adopt digital innovations."*** So that's not a place to innovate. That's one of the point's I'm going to make here. Where to innovate has

as much to do with your success as what you innovate. The barriers are unaligned budgets, annual operating budgets, and separate budget times lines and processes. When I tried to do a multicenter study with Larry Higgins looking at intraoperative nerve management after Latarjet procedure at two hospitals where we did this procedure, it all came down to resource utilization and who's going to pay for it, and who's going to manage it, and my budget doesn't allow it, and I have other things to do with my time. Yet, that was a perfect example of trying to integrate care in a research project. The barrier to doing that was the institutions themselves. The last thing they're thinking about is integrating practice. So that's a big question mark as well.

So, the question is, what about innovation, where does it come from? Einstein said a long time ago, ***"Imagination is more important than knowledge."*** So how do we innovate value where we are? Whether you're at Kaiser, you're somewhere in private practice, you're at the Mass General, or maybe you're in industry and it's part of your strategy for how you're going to advance your bottom line, I don't know, it's all a question.

Here's the way I look at it, and I ask myself why I'm still where I am. There are personal and professional barriers to be an innovator. Where you work is very important. Are you a square peg and is your institution make you fit in a round hole? Like that? Or, do you find yourself like this, and you're constantly trying to figure out how to fit in an environment that just doesn't suit my own personal passions? That's an important question to ask, most of you are more senior, but I say to the fellows now when they go out into their practice, constantly take your pulse and figure out is this the right environment for you? There are countless studies at HBS about people who failed first because they were in the wrong place, and then they succeeded fantastically when they went to the right place. That's adversity and resilience and understanding who you are.

I think Jon Ticker showed this before, but this is worth revisiting. Your financial health affects your outlook. Codman, in times of plenty, inverted this pyramid. You can't see it from back there, but basically, patients were his first priority and ego and his needs were on the bottom because he was doing fine, thank you very much. He was making money, life was fine, things were good, he was able to be generous with his efforts. The problem is, when you're not successful, then your ego and needs and the needs of your family take precedent and you don't have time to devote to measuring a damn thing or doing anything along the lines of research. We're disincentivized, many of us, to provide any value in the research we do, there's no compensation for that. That's what you do for your own personal desire, and I don't know many compensation plans, even though they might pay lip service to it, that really pays much attention to that.

There is this concept from London Business School about soft and hard models of human resource management. The reality is, while these are not necessarily the greatest companies always, for-profits can't afford to be bottom up in terms of developing talent and scaling it internally and recognizing that the intangible asset of the talent you have is critical to the success of the organization. Academic medical centers are exactly the opposite. They hemorrhage talent all the time in terms of fit. They are really brand driven, the large academic medical centers. They figure that the brand will survive and that the people in the building are less important. These other places here have a major brand identity, but they're driven in a large measure by talent, from the very beginning, through where they are now. Poaching talent is a big deal. Academic medical centers don't do a particularly good job of poaching talent, at least to my knowledge. If anybody has a comment along the way I want to, kind of, call me on it, please do

because I'm lecturing at you, and it'd be nice to hear if you have a difference of opinion, just shout out, okay?

This is a concept that I learned in my last period at Harvard Business School that I really liked from Michael Tushman who ran our program. It's a concept of ambidextrousness. Only 1% of the population is ambidextrous. So, he wrote this article called the ambidextrous CEO and firms thrive when senior teams embrace the tension between old and new and foster a state of constant creative conflict at the top. Those in industry here can ask yourselves, are you in that kind of organization? Or a different kind of organization? Because the courage to take risk is very, very important if you're going to move your organization forward. So, I submit to you that every individual here should think the same way. How do you maintain your cash flow, your success, the rest of it, and still have the courage to innovate by taking risk, because you're never going to do a damn thing of value unless you do that, in my opinion. So, individuals and their organizations thrive when each can work to continue what they do well and innovate to improve at the same time. That's a personal commitment as well as a professional commitment. Unfortunately, many of us don't do that, most of your probably traveled across the country because somewhere deep inside you probably agree with this. Many folks who just stay home and, I don't know, walk the dog, or have dinner.

This is something I found online from Harvard Business School. If I understand correctly, and Derek may know better, I think this was a study they did looking at the impact weak cultures have, and strong cultures have on the bottom line. It's not a mistake, it's true. These kinds of values I'm talking about drive profitability, they will drive profitability for you as an individual, and they drive profitability for the organizations themselves to create these cultures. How many of you have been a part of an organization or have been doing this long enough to see leadership, and its ineffectiveness and how much it's hurt the organization before it was changed? I'm going to guess almost everybody, and I've witnessed it for the last twenty years where I work. It's unbelievable how little self-reflective people are. When you listen to a guy like Jimmy talk about it, and you wonder, "what the hell is my CEO doing?" they're not even on the same plane. Yet, I work in an organization that has $12 billion in revenue and 1% margin negative position that cuts cost indiscriminately, just as Bob Kaplan was talking about. If you look at the adoption curve for technology and you've got the innovators on the left and the early adopters. My personal view in where I work is we're late majority or laggards. This is very important for companies when they introduce new technologies, because of course they must do a litmus test of the market place, and decide who's going to adopt this first, who's going to drive the innovation in terms of validation through evidence-based medicine? It allows the late majority or the laggards to then follow suit, not waste your resources in markets that don't work, which includes the context of international markets just the same, which involves complex financial analysis. Now there have been many promising technologies that follow this curve. This is called Scott's parabola. You get a promising idea, everyone gets excited, it becomes the standard, and then we start to realize it's not so good after all. We learned this with arthroscopic thermal shrinkage, some of which resulted after one of the large companies acquired this. The executives of the company were all indicted in criminal charges for withholding information about the technology. Metal on Metal hips? Oh my God, that's another one. Or Vioxx, or intra-articular pain pumps. There are many more, and it takes a lot of courage to look at these opportunities and ask yourself, are you making the short play or the long play, and that includes when you guys sign on as consultants for certain technologies, you should wonder too what this means for you and the organizations you're partnering with. Really, if you do this sort of thing

Tushman talks about, which is exploiting what you do well and exploring what you're going to try to do better, you drive the more vertical curve here. So down here is incremental innovation, slow growth, same old same old, that kind of stuff. The one above, the new care models, are the ones that drive disruptive innovation. Now filtered into that is the stuff we just heard, the headwind you get on price pressures and analyses, and where are you doing it? Academic medical centers, they must be risk averse, they must give talent freedom; they don't. It's a problem in that scenario how you're going to do that.

Codman, in my opinion, there may be others for sure in the European literature, was truly the first entrepreneur in shoulder care. The first anesthesia record, the first book in English on the Shoulder, the first tumor registry, the first use of radiography for fractures, which is probably why he had no progeny. He probably exposed himself to radiation and sterilized himself and couldn't have the next generation of Codman's, it's an interesting thing. In his book, especially the epilogue, first part of it is all his reflection on himself and his journey through life. This is how it goes, somebody in our class at HBS sent this to me. You must be willing to meet resistance and go downward, and for startup companies they call this Death Valley and it has to do with the funding, to get to the top. I don't know, do any of you understand that Google almost went out of business and yahoo tried to buy them before they finally hit it? It's certain perseverance, and it's not hard to imagine what Jimmy said plays a role here. That's just not the way many of the people we work for think. And if you think that way, don't be surprised if you feel uncomfortable where you are, it's probably because you would rather do something like this.

So, let's look at a few innovators. Neer. And Not everything he said was right, Anterior acromioplasty was not right. However, at the time he had the courage to introduce new ideas, it was a different time; he was more of an autocratic person, commanding control, and he did it. Sir John Charnley and Bill Harris, we're not talking about shoulder surgery now, they were pioneers. What's fascinating is that neither one was in strong academic medical centers. Well, that's not true, Bill Harris was at the Mass General, but you know, he was in private practice and he was fully funded by industry, no funding from his organization, and cross-linked poly-ethylene changed the world. If you talk to him about it, he realized how much impedance there was at the time they ignored him, now they would resist him. Now they don't resist him, they take large part of his equity, and value he created. In fact, recently his lab wrote this analysis on the impact of crosslink polyethylene and the overall cost of total hip replacements. One of the things that's interesting to me when Andy did his presentation was, unless I'm mistaken, the only person capturing value here is the patient. Not the hospital, not the surgeon. The surgeon might have better outcomes and he gets patients, but the hospital must pay a premium on the cost of the polyethylene to benefit patients, and that's outside of the episode of care, how do we reconcile that moral imperative, I think, with the fact that the hospital must pay for it. Someone's got to pay for this new technology. It's better for everybody, but I still don't understand how we address that. Reinhold Ganz at the end of his career invented the concept of femoroacetabular impingement, he was long done being an academic guy, he changed the face of hip arthroscopy, or developed hip arthroscopy consequently. How about Paul Grammont? Widely reviled in France, nobody knew who he was when this came to the United States. It had already failed multiple times. What made him different to have the courage to innovate and change the face of what we do with arthroplasty, none of us would go back. When this first came to the United States, and I remember having a conversation with the vice president of my hospital, they

showed me the income statement with everything they were going to lose with every case that they did. Now here's the deal: it was one company, and when other companies came on board, prices dropped, which is the way it goes with calculators, and everything else, that's the reality. That company has all the right to capture that value to pay for the cost is took to innovate it. But what do we think, it comes out of thin air? And nonetheless, it's changed everyone's life.

Now, I was talking about partnership before and I get a little bit nostalgic because Larry is here with me, but we're not Watson and Crick. We're certainly not Kahneman and Amos Tversky who basically invented the concept of behavioral economics. But I'll give you one piece of advice, really, really, really, great opportunity for you if you find a partner who believes the same things you believe and can help you down that road. Even Neer had McLaughlin. McLaughlin helped him with understanding fracture treatment, rotator cuff repair, and modern arthroplasty. And of course, Pascal Boileau and Gilles Walch, are an example of two individuals who journeyed through decades to change the face of arthroplasty, you might argue how incremental it was, or whatever, but I'm a very good friend of Christian Gerber, he did it alone. He didn't have a partner. He had collaborators, but he was commanding control. These guys did it alone. In the end, while I love Christian, the weight of what they did will be much greater than what Christian did. He's not here and hopefully won't watch this video.

So how do we innovate for value? That all depends, and I want to make this about measurement because that's what we're talking about. Why not? Why should you? What should you measure? We talked about the value equation. What matters most is how you see yourself. The last part of my HBS program has to do with understanding who you are, because whether you're leading or taking care of patients, your ego always gets in the way. The answers that I've gotten from some about the barriers are, "I'm good, why measure?" or "I don't want anyone to know," or "I'm too busy," or "I don't have the resources," or "There are regulatory problems that get in my way." And this is an analysis of my own organization, and since becoming quality and safety officer, I took a report card of all services. Of nine services, only three measured anything. If you look here, the X's across the board are me. People doing shoulder measure zero. Now look at this for a moment and ask yourself, in the home of Codman, what would he think? All my colleagues don't measure. They're not bad people, it's just not a priority for all the reasons I just told you. How am I supposed to get them motivated and interested in what Bob Kaplan was talking about in driving value when they don't want to measure a damn thing? To be fair, if you really want to be cynical, I don't really think the hospital wants them to because the hospital is getting paid for the service, not for the quality of the service in the current matrix that exists. It's cynical, but it's reality. So, do you use comparisons to benchmarks? No. And this is interesting, talk about delusional, how frequently do you get together and analyze complications to improve? Look at this, almost 60% of the time, even though they don't measure anything! So, I have no idea what they're getting together and talking about. Except maybe at the end of the week having a beer at Harvard Gardens. I'm not sure. Even Codman in his book wrote about how the cost of a rotator cuff repair is lower when it succeeds than when it fails 100 years ago. Even now, we don't know what the cost is per surgeon per rotator cuff repair. This is from Larry, he gave it to me before, by measuring you improve, the Swedish myocardial infarction registry. You can see that when it was mandated that they measure, even the lowest performers improved, that created value for everybody. Lenny Johnson, who many of you may not know, but Lenny is an icon. Lenny single handedly invented arthroscopy in this country. Several decades ago, Lenny Johnson proposed, to

my knowledge, the first bundled payment for arthroscopic surgery. And he wrote this in his article in arthroscopy, "There is a war out there in medicine. The ammunition is data. The doctors have none." When he made a warranty on outcome, he got a premium, a pricing premium, for that warranty, and the year after he did it, he profited 30% more than he did the year before because he banked on himself and his successes. Bundles can work if you have the right collaborator and the hospital is willing to let you do it. So, what we did, and Larry helped me with this along the way, was to do a consumer innovation, I think that's probably what Herzlinger called this, based on measurement. Why would measurement drive a damn thing? So, your patients when they come, only want one thing, and this is written about repeatedly, they want confidence and reassurance. Their journey is going to be without a bump, and they're going to have a reliable, reproducible outcome. They will come for that. It's fascinating when you look at who's coming and how they're coming. So, we have quality measures here, we carried on after Larry left, we have "How fast will I recover," for recovery, so we're following what Porter talked about. And this is an example, "Oh, I've heard reverse prosthesis is so terrible, it's just a salvage procedure." Oh no, the process of recovery for pain, the process of recovery for durability of pain relief is identical, there's no difference for my patients filling out their SOS questionnaire, there's no difference in terms of the process. You think that gives them comfort when they come to you? Same thing for their subjective value, the same. The only outlier here is a revision case. If you look at ASES, it correlates to SANE, which begs the issue of why the heck do you even both with ASES. Rich Hawkins talked about that, we have all these complicated measures, simple is better. SCR versus reverse prosthesis, interestingly, and registries have their issues, but this is global data, SCR and reverse prosthesis at 24 months have the exact same pain relief, at least in the registry. Now this is not a prospective randomized study, but nonetheless, it's something you shouldn't ignore. That said, functional improvement seemed to be more durable with reverse than with SCR. Maybe there are confounding variables here and it's worth analyzing, but at least we have something we can track, and we can use it for marketing.

So, Porter said, this a virtuous circle for value, and you benefit from becoming an expert because it increases your revenue and your margin most likely. And Bob Kaplan said, "If you can't measure it, you can't manage it. If you can't manage it, you can't improve it." This give you a competitive advantage to improve outcomes and reduce cost, and it gives you the opportunity to collaborate with industry. Some of these things we've been talking about in terms of value and why you'd want to use one product over another to achieve this, because if the products are connected to the most successful surgeons, maybe they have something to do with it and maybe it drives the value of proposition.

So, I'm going to finish up here in a little bit, but this is Michael Porter and I standing in front of a mural of Codman, which was interestingly going to be put in the basement of my hospital, so I commissioned it to go on the wall. My message would be to say this: if you want to innovate, if you want to succeed, find a good mentor, Jimmy sort of covered that. Find a passion, for that matter, be in a place where you can pursue your passion. Be prepared for criticism, it's a guarantee. You know you're on the right track when your enemies are more vocal than your friends. Surround yourself with people who are smarter than you, I have had no problem doing that in my career, and you've got to listen to them. And measure what you do, measure, measure everything, preferably things that are meaningful. Be willing to take risks and be willing to fail, and he talked about that a little bit as well. And the problem is, most of us work in environments

where taking risks and failing are not acceptable. Here we have the chief of quality and safety telling you to take a risk and fail, but that's the only way we improve.

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