Growth And Innovation In Medical Devices: A Conversation With Stryker Chairman John Brown

How a multibillion-dollar device company sustains 20 percent growth in earnings per share each year without losing sight of its responsibility to patients.

by Lawton R. Burns

ABSTRACT: John Brown, current chairman and past chief executive officer (CEO) of the Stryker Corporation, reviews the development of his device firm and the medical device industry over the past thirty years. Brown describes the trajectory of innovation in medical devices and the managerial and organizational strategy he pioneered at Stryker to achieve consistently high growth rates over the long term. He also shares his perspective on some of the current policy issues facing the device industry today, including product safety, conflicts of interest, rising product prices, and direct-to-consumer advertising. [Health Affairs 26, no. 3 (2007): w436–w444 (published online 1 May 2007; 10.1377/hlthaff.26.3.w436)]

Rob Burns: John, you've been with Stryker since President Carter was in office. Over that thirty-year period, what major changes have taken place in the industry, in your view?

John Brown: I got into medical devices five years before I came to Stryker. I was running Edward Weck, a subsidiary of Squibb, which made general surgical instruments and all the shiny stainless steel equipment that you see in an operating room. Back then, the medical device field was quite small. Orthopedic implants were only ideas in the minds of the surgeons. Very little was going on. Since then, the sophistication of devices, surgeons, procedures, and companies making the products has increased significantly. A good example is the development of the cardiac pacemaker business, which was very small in the 1970s but is a large and important segment of the medical device industry today.

Burns: So, like biotech, this is a new industry.

Brown: Exactly. The old device business is gone. The new one today is bigger and better.

Burns: Stryker actually operates many different businesses. You have instruments; orthopedic hip and knee implants; other orthopedic products like spinal, trauma, and CMF [craniomaxillofacial] implants; products for endoscopy suites and the OR; and beds and stretchers. And you have 400-plus orthopedic...
rehabilitation clinics. Did I miss anything?

Brown: I don’t think so.

Changes In Orthopedics

Burns: What have been the major changes in the orthopedics business?

Brown: Early on, the implants lasted only five to ten years. The industry has made dramatic improvements in implant lifespan through advances in design and in materials. The physical demand on these implants has gone up, too, due to patient obesity. The industry has produced some phenomenal product improvements, but these occur incrementally, on a year-to-year basis. There have been very few sweeping changes in orthopedic implants, but when you compare today’s products to the earliest ones, the differences are significant.

Burns: Do you see any breakthrough, revolutionary technologies out there in orthopedics?

Brown: I have long felt that biotechnology might have a revolutionary impact on orthopedics. That has not yet fully materialized. We started out twenty years ago doing some collaborative research with a company called Creative BioMolecules to isolate and develop a bone-growth product. We’ve had good success in the lab and in some of our studies, but poor success at getting FDA [Food and Drug Administration] approval. Our friends at Medtronic have had much better success with the FDA than we have.

Burns: This is their bone morphogenic protein (BMP) product, Infuse?

Brown: Yes.

Burns: Is BMP a growth market?

Brown: In time, we will see joints and joint surfaces replaced and regrown using biotech products, as opposed to putting in mechanical implants.

Burns: What about the recent trend toward absorbable implants?

Brown: I would place my bet more on the bone morphogenic proteins than on the absorbing implant.

Burns: But in Medtronic’s case, the BMP is used in combination with some of the current metal devices out there—a new type of convergent product, like a drug-eluting stent—whereas the absorbable implants would actually replace the metal that’s used.

Brown: And then be absorbed over time, since they’re no longer needed, now that the bone growth factor has produced new bone.

Burns: That would seem to be a little bit more revolutionary change.

Brown: That’s a good point. There are places where you can see that combination work.

Burns: What has changed in some of the other areas, like endoscopy and the OR?

Brown: I’ll tell you about a little incident from years ago. Not long after I joined the company, I was at the annual meeting of the American Academy of Orthopedic Surgeons. I was standing in front of a doctor’s poster exhibit, and he had outlined what he had been doing in arthroscopy. This was in 1977. I recall that two older orthopedic surgeons were looking at the poster, too. I remember vividly that one surgeon turned to the other and said, “Well, they can do that if they want to, but I’m still going to open it up so I can see what’s going on.”

At that time, there was a lot of skepticism among older orthopedists as to whether arthroscopy was a good procedure or not. Today there are thousands of athletes who are back on the field in a matter of days, because they have a torn meniscus or ligament that is repaired arthroscopically using very sophisticated endoscopes and mechanical devices. So it has gone from being new and questionable to being accepted by mainstream orthopedics.

Burns: What is your view of minimally invasive orthopedic surgery? Is that going to shake this field up?

Brown: I think that every orthopedic surgeon and every patient wants to minimize scars and soft-tissue damage when an implant is inserted. Every company today is working hard to come up with techniques and products that minimize the amount of soft-tissue trauma. But the minimally invasive approach still has some shortcomings.

Concerns About Pricing And Quality

Burns: Given the fact that most of the innovation taking place in orthopedics is mostly in
cremental, are companies like yours going to face increasing pressures over pricing going forward, or does that wax and wane?

Brown: Well, it does have cycles. But the cost of health care is a social issue, and it’s a worldwide issue. Every payer feels like they’re paying too much—be it government, employer, or individual. It’s going to continue to put pressure on the suppliers to justify their pricing structures.

Burns: How well do you do that at Stryker?

Brown: No, not as well as we would like. The thing with implants is that getting a reduction in the price is not nearly as important as being assured that you’ve got something that’s going to last fifteen to twenty years. A patient doesn’t want to save a couple thousand dollars and then learn that their implant has to be taken out seven or eight years from now, as opposed to paying a higher price for a premium product and knowing that it could outlast their expected life. The onus is on manufacturers to make sure that they’re delivering a product that meets the expectations of the surgeon and the patient. If they do that, then I think the system will give them a fair price.

Burns: How do you document quality with implants, when you don’t know the outcomes of the next generation for at least ten years?

Brown: There’s no accepted clinical study that shows that short-term results predict long-term results.

Burns: If there’s no evidence base, what does the conversation look like between you and a large commercial payer?

Brown: So far, it’s been primarily a conversation between the hospital and the manufacturer, as opposed to the payer.

Burns: Have the group purchasing organizations made any headway in their contract negotiations with the device companies?

Brown: My sense is that it has been limited.

Burns: Is that because they and their hospitals have trouble getting physicians to standardize their implants?

Brown: No, I think the difficulty is that market share in orthopedic implants just does not shift on the basis of price. It tends to shift on the basis of quality and the characteristics of the product itself.

Burns: Many hospitals have developed new technology committees and value analysis teams to evaluate all of the new technology coming into hospitals and try to rationalize what they buy and what they pay for. Does that impact the orthopedics industry?

Brown: Not yet. That’s not to say that it won’t.

Burns: Is that because they focus their attention elsewhere, on different kinds of products, like cardiovascular?

Brown: Yes, there are more dollars there.

Burns: Another issue is the relative importance of the following two factors in the success of orthopedic surgery: (1) the design of the implants you make and the materials that go in them—the technology side, and (2) the skill, experience, and volume of the surgeons who put them in. Has the relative importance of those two things changed over time?

Brown: I don’t think so.

Burns: Which is the more important?

Brown: That’s like asking, “Who do you love the most, your mother or your father?” One without the other one is a failure. They’re interwoven. A great physician can get a good result even with an average product, but a poor surgeon usually cannot get great results even with a great product. Surgical skills are absolutely critical. I would say that product quality and the characteristics of the product are right behind the surgeon’s skills, but you need both.

Burns: You’re basically competing on the design of your products and the materials. To what degree can this industry advance, when the rate-limiting feature is the physician’s skill and volume, particularly when most surgeons don’t do that many procedures in a year?

Brown: Most surgery is done by surgeons doing a pretty good volume. But because of the knowledge gained through the Internet, sophisticated patients and their families know who are the manufacturers, who are the leading surgeons, and they insist on getting the best surgeon and best product.

Consumerism In Orthopedics

Burns: You’re suggesting that consumerism is starting to creep into the device area.
Brown: It is here. For my own mitral valve repair, it didn't take me long to figure out that the best place to go was the Cleveland Clinic. Burns: You're suggesting that the average patient will go to an orthopedist they found on the Internet who has a good reputation? Brown: They will also talk to their local practitioner who's going to refer them. Burns: But would they ask for the Jack Nicklaus hip? Brown: They do, but we believe that the best situation is where a patient comes with information and then listens to the advice of their surgeon about which implant is best for them. Burns: Now, is that going to be a smaller sales channel supplementing the normal sales channel, where sales representatives go to the surgeons? Or is this new channel going to grow fast? Brown: I don't know. I know it was somewhat controversial when we did our first direct-to-consumer ad with Jack Nicklaus. We did get a good bit of feedback that several patients were coming in saying, I want the same thing Jack's got. Burns: Any fallout from that ad campaign? You know, people saying you're beginning to look like the pharmaceutical companies? Brown: Yes, there was some early criticism, although everybody is doing it now. So, we were just the first. Burns: Your new CEO, Steve McMillan, has a background in pharmaceuticals. Brown: Yes, and his professional expertise really is in marketing. Burns: Was that a conscious decision to bring in somebody with more of a marketing and consumerism perspective? Brown: It was by happenstance, but I think it was good, because we were not noted for being marketing whizzes.

Medical Device Innovation
Burns: In the medical device industry, where does the bulk of the innovation come from, and how does it come about? Brown: Medical device innovation comes from the labs, the engineers, the companies. It also comes from the ORs and surgeons' experience, academic labs, and universities around the world. I don't think there's any one clear path to innovation. The industry engineers have close working relationships and open discussions with a group of surgeons, such as, “Here's my idea about new material or a new design.” Surgeons often say, “I've got an idea on how to improve this design. You should change the following.” It's a back-and-forth process.

I will say this. There are a few people in the industry who seem to have this gift of coming up with new ideas. Every company has a couple of engineers who just walk in one day and say, “Aha, guess what I have invented?” There are also gifted surgeons out there who have the same characteristics.

Burns: What we call “drug hunters” in the pharmaceutical industry.
Brown: It's just a gift, an intuition. It's based on great powers of observation and, in the surgeon's case, experience.

Burns: What's the role of venture capital firms in innovation? Brown: They're funding a lot of start-ups in orthopedics today, many of which are in spine, which has seen explosive growth in the last five to ten years.

Burns: Are they developing the farm system from which you will acquire or partner the new technology of the future? Brown: Perhaps.

Burns: I mean, to what degree is there a symbiotic relationship between your firm and the venture capitalists? Brown: One of Stryker's directors is a venture capitalist. So we've got a relationship there. But very few major orthopedic companies today were started by venture capitalists. Maybe Kyphon and ArthroCare were, but they're in the newer peripheral areas of orthopedics, like spine and arthroscopy.

Burns: So the companies that you consider for acquisition or partnering developed independently of the venture capitalists.
Brown: Yes, most of the time.

Growth And Earnings At Stryker
Burns: Let's talk about Stryker. One thing I was really struck by is that over twenty-five to
thirty years, Stryker has achieved annual growth and earnings per share of 20 percent or higher. That is a feat probably not matched by too many firms. I'm curious about how you've managed to achieve that consistent set of results over a long period of time, despite the typical market ups and downs, the increasing pressure that's been put on implant pricing, changes in technology, changes in reimbursement.

Brown: We adopted the goal of increasing earnings per share by 20 percent in 1979. We had achieved it previously, but when we decided to become a publicly traded company, and after being asked by the investment banking community how we were going to fulfill our goal of being a growth company, it became clear that the threshold there was 20 percent. With 20 percent annual earnings growth, you could be called an emerging growth company. So that's how the goal was established. When I came back and sat down with senior managers of the company and announced that we were going to have a 20 percent growth target, they were somewhat skeptical. But we did it, in 1979, in 1980. And then everybody started coming around to “we can do it.”

The beauty of the 20 percent growth goal is that you don't have to argue about what the goal is going to be. You argue only about what's the best way to get there. Each year we created an operating plan that would produce 20 percent bottom-line growth. We also made very sure that everybody understood that we wouldn't do anything illegal, unethical, or immoral. Moreover, around 1980, our product line was getting somewhat diverse, but we were operating with a centralized management system. That's when we started setting up divisions. Now, I can't argue that was my idea. What we have done for the last twenty-five years is nothing more than what [Johnson and Johnson] did back in the 1930s, where they built separate management organizations around a given market and then gave them the autonomy to focus on that market and to determine what they had to do to be successful. That's exactly how we operate our divisions.

Stryker grew by focusing on a single goal of delivering 20 percent annual profit growth and by having management teams have control over R&D [research and development], manufacturing, marketing, and sales. They become experts in a market and know everything that's going on in the marketplace so they can best compete in it.

Burns: So there are no common synergies across these businesses?

Brown: There are certainly some, but if you brought McKinsey or any of the consultants in, they would quickly point out that with decentralization, we're wasting a lot of money. On the other hand, if you look at the results, it's been money well spent.

Burns: One of the things you've been quoted as saying is that you can actually achieve control through decentralization. Can you explain this?

Brown: All of our divisions have very formal budgets and operating plans. Every Monday morning at seven o'clock, we have a staff meeting and conference call with operating divisions around the world, and everybody reports on what their results are going to be for the month—sales, quality problems, supply issues, anything that needs to be addressed. We don't solve a single problem on the phone call. We just identify them. But the focus is always on how do we achieve our results this month, and how does it look for this quarter and for the year. Anything that looks like it is going to throw us off is brought to management's attention, and then it is dealt with offline.

Burns: So, it's getting immediate feedback on where performance isn't shaping up.

Brown: Right. Then, we get the monthly financial results and formally review those. It's better than trying to do it centrally. If you say that you can't spend this money, or you can't do this without approval from above, it's a limiting factor. The real key is having a common agreement on what the goals are for the company and for each division, and having very responsible people in charge.

Burns: Do they compete with one another?

Brown: Oh, yes. I was guilty of fanning a lot of internal competition. Each month we pub-
lished a “totem pole” of sales and profit growth rates. This annoyed a few people, but most accepted it and responded accordingly. It was always fun to be on the top, and it was not much fun to be on the bottom.

**Burns:** You have some businesses here that are not viewed as growth businesses, like beds and stretchers, instruments, or rehabilitation clinics. How do you achieve 20 percent growth in commodity areas?

**Brown:** From a financial viewpoint, our bed and stretcher business has seen phenomenal top- and bottom-line growth in the last four to five years. The same thing is true with instruments. It all boils down to focusing on better products and quality. In some ways, the instrument business is a lot like the car business. It’s never revolutionary; it’s all evolutionary. And it just continues to improve. But if you’ve got a product that the surgeons love to use, and the OR supervisor doesn’t have a lot of maintenance problems with it, you’ve got a winner. It’s quality leadership.

**Burns:** Stryker is not a “pure play” in orthopedics. You have all these different businesses. You’re sort of an outlier in terms of how well-diversified firms work. How do you explain that?

**Brown:** With the exception of our physical therapy business, there is a common denominator for everything. All the rest of our businesses are medical devices. We’re not a pure play in orthopedics, that is true. But even in the bed and stretcher business, there is an orthopedic connection in that many of those emergency room patients are orthopedic patients, and that’s what prompted Dr. Stryker to invent bed and stretcher products back in the 1940s and 1950s.

**Burns:** But those businesses aren’t sharing sales reps, R&D, or marketing.

**Brown:** We believe very strongly that you need specialists calling on specialists. For example, in arthroscopy, you want a sales force that’s expert in all the facets of endoscopy—the technology and treating the soft-tissue injuries that occur.

**Burns:** So you’re moving more toward each operating unit having its own dedicated sales force.

**Brown:** Absolutely.

**Burns:** And they’ll specialize in those products?

**Brown:** Yes.

**Burns:** If these are indeed growth businesses, are you growing your sales forces in each one of these?

**Brown:** Yes, I think, without exception.

**Burns:** Are your competitors also growing their sales forces?

**Brown:** Yes.

**Burns:** Are we beginning to see something like what we saw in the pharmaceutical industry in the 1990s, with the ramp-up in sales forces and detailing?

**Brown:** We’re not that aggressive. Our headcount additions correlate with sales increases. So, with 20–25 percent sales growth, you probably see a 15 percent increase in sales force.

**Burns:** Your company is at $5.4 billion in sales. As you get bigger, doesn’t it get harder to maintain that 20 percent target?

**Brown:** Well, not for me.

**Burns:** For your successor?

**Brown:** Yes—Steve and the current leadership team do find it challenging, but it has been challenging since we first set this goal in 1979.

**Burns:** That’s the problem GE faces: How do you grow something that big? You’re sort of entering uncharted territory here.

**Brown:** But if you accept the philosophy of grow and divide, then it should have no limit.

**Burns:** You mean, grow and divide the company into segments, separate businesses?

**Brown:** Yes.

**Burns:** So the trick is to be decentralized and do what J&J does. You don’t necessarily have any big blockbuster products, but every product sells well across lots of divisions. Is that how you do it?

**Brown:** Yes.
Burns: Let me talk a little bit about the company's management and strategy. No one division or product is going to make you or break you. Was that a conscious strategy on your part?
Brown: It just evolved. I didn't start out twenty-five years ago saying that this is our strategy.
Burns: What else would you point to?
Brown: Two or three things. First, I really believe in simplicity. If you can't articulate what you're trying to do in one or two sentences, then you can't expect employees to endorse it. For a number of years we had a mantra, “Invent it, make it, and sell it.” You may say, that's pretty trite. But, yet, if you look at the great companies over the years, that's what they do. The point I made to all of our management people was, any function we have in a company that's not focused on one of those three things is overhead, it's added cost. So we kept our focus on those three things.
Burns: You've mentioned simplicity, focus, and specialization, and that you have these different tasks—invent it, make it, sell it. Are those all silos? How much do they cooperate and interpenetrate one another?
Brown: Within each division, these functions are quite interrelated. Steve is also trying to get more interdivisional cooperation. I'm sure we could use that, but we want to make sure that we don't lose the accountability for producing results when we work across divisions.
Burns: Now, you're known for pursuing an organic growth strategy. How much do you allow for acquisitions and mergers, some of which you've done? Are those two things you try to do equally well, or do you tend to focus more on the organic side and just acquire or in-source technologies when you need them to fill something?
Brown: The latter. Our focus has always been that we should be able to come up with enough new ideas internally without having to go outside. On the other hand, we should never ever reject an idea without looking at it.
Burns: Your bone morphogenic protein—was that something you were developing in-house and then you developed an outside partnership as well?
Brown: We were interested in it inside, and then we developed a contractual relationship and partnership with Creative BioMolecules.
Burns: So, to be flexible, you try it both ways and then evaluate which one of those two works better?
Brown: Sure.

Spending On R&D

Burns: Many industry critics complain how little medical device companies spend on R&D. By contrast, a recent Booz-Allen study labels Stryker and a few other firms as “high-leverage innovators” that get more bang for their R&D buck, stating they're actually able to spend less on R&D and get more from it. They put you in a pretty select class of firms. According to Booz-Allen, you outperform your peers on seven different metrics and show that money alone cannot buy effective innovation. How do you view the charge that device firms don't spend enough on R&D?
Brown: I would say a couple of things. An organization can only handle so many new ideas at a time. The worst thing you can do is try to bring too many new products to the marketplace at the same time. And many a company has failed, not because they didn't have good ideas, but because they were trying to do too much too quickly. We have never ever said that we need to spend X dollars on R&D. We've always said to the division heads, You've got to spend enough money to make sure you have enough new products to generate 20 percent profit growth. Whatever that takes, we will fund. But, back to your question, there is not a really good correlation between R&D spending and financial success.
Burns: Does each business unit have its own business development person?
Brown: Most of the divisions do. Steve has brought in a business development person for the corporation to supplement their efforts. Under our decentralized structure, if we acquire anything, then one of the divisions is responsible to run it. Therefore, they should be the ones to justify an acquisition.
Transparency And Conflict Of Interest

**Burns:** Let's turn to the intersection of your industry with the policy arena. Recently, we have seen a spate of articles published in *Journal of the American Medical Association*, the *New England Journal of Medicine*, the *Wall Street Journal*, and the *New York Times* about conflict of interest. What's your take on this issue?

**Brown:** I think that practitioners want to deliver good health care and do the right thing for their patients. They do get compensated for their ideas and their time. In the device industry, there needs to be ongoing dialogue between physicians and manufacturers to optimize the product, the instruments, and the surgical techniques. Reporters don't seem to understand this need because it is different than what is required in pharma or other industries, and I believe that their coverage often reflects this lack of understanding.

**Burns:** What do you think about the steps that Medtronic and its orthopedics division have had to go through as a result of the investigation by the Department of Justice? They have to make sure that whatever payments are given to physicians, those payments were earned and there was a clear expectation of services to be performed for those payments. They have to be sure that they pay fair market value for the new ideas these physicians come up with. They have a corporate integrity agreement at Medtronic to monitor all of the company's financial deals with physicians. They scrutinize the expense reports of their sales representatives to make sure they're not doing anything wrong with customers. Is this what's called for?

**Brown:** There must be a clear connection between what a consultant is paid and the value of their contribution. They should be compensated for how much they add to a research program or the development of a new product. It is unfortunate when regulators feel that it must take a court order to have this occur. We ought to do it. It's just good business.

**Burns:** Now, on the flip side, will increased transparency and oversight hamper the innovation process taking place between your R&D people and these surgeons?

**Brown:** I don't think so.

**Burns:** The two can coexist?

**Brown:** Sure.

**Burns:** Another initiative proposed recently in *Health Affairs* is to have a national database that provides comparative data on the prices and quality outcomes of products in the same category.1 How would the orthopedics manufacturers view that suggestion?

**Brown:** I'm not going to speak for the industry, but I think that if it's good for the suppliers, then it would be good for the providers. If you're going to run a national registry on products, then you also should run a national registry on surgeons and the hospitals that provide these services and see what their record is, too.

Product Safety

**Burns:** Another issue that has come up deals with product safety: Vioxx, drug-eluting stents, defibrillators. What's your take on this? Do we have a safety problem, or is it just the fact that we are implanting so many of these things that the issue has finally hit the radar screen? How do you think we're handling the safety issue?

**Brown:** It's been a media-fanned story. Granted, there are product failures; there always have been. But what the media has missed is the number of lives that are being saved or enhanced by these products, be it stents, defibrillators, pacemakers, hips, or knees. Saying “the product has to be perfect” is not right. It's not good medicine, and it's not good social policy. If you're going to insist that the product has to be perfect, there's no product that will ever meet that standard. Right or wrong, everything that we do involves probability and some risks.

**Burns:** Let's talk about some of the potential causes. One issue is a lax FDA approval process or postrelease oversight and monitoring of the product.

**Brown:** Manufacturers are very concerned about potential liability costs. There's many a CEO that wakes up at two o'clock in the morning in a cold sweat thinking about what could go wrong here. I'm not sure that the in-
industry needs more FDA oversight.

**Burns:** Some think that the clinical trials conducted in the device industry might not be large enough or of sufficient rigor, or that the 510k approval process might not be the appropriate hurdle. What's your response to that?

**Brown:** I think the 510k process has worked well. In general, the industry has done a pretty good job with clinical trials.

**Burns:** Is one possible problem that there are too many products coming out to evaluate and monitor?

**Brown:** As I recall, there are about fifteen or twenty premarket approvals [PMAs] every year. It's not a huge number.

### Impact Of Regulations

**Burns:** Let me ask you about another policy issue. Are there other regulations out there that companies like yours find onerous or impeding of innovation?

**Brown:** I think American industry in general is spending too much time on compliance issues and not nearly enough time on being better competitors. What I think industry and Washington are forgetting is that the companies headquartered in Beijing are not doing that. They're focusing on eating our lunch. The pendulum has swung just a little too far to the compliance side and needs to get more focused on improving our competitive position in the world market.

**Burns:** Are you referring to Sarbanes-Oxley (the Public Company Accounting Reform and Investor Protection Act of 2002)?

**Brown:** Sarbanes-Oxley is part of it. But you've got the audit committee, the compensation committee, the governance committee, and all these committees now. So board meetings are filled up with committee reports and making sure that we're doing everything in accordance with all the regulations and laws. Who's worrying about how we're going to compete with all this foreign competition?

**Burns:** Let me ask one final question. Since the early 1990s, congressional attention has focused on the pharmaceutical industry. Do you think that the device industry will be the next big target?

**Brown:** I would be very surprised if it did. I think that the American public feels that technology has been good for them. The average Joe doesn't complain about the cost of his hip, the cost of his knee, or the cost of his pacemaker or defibrillator. On the other hand, you hear countless complaints that someone just came back from the drug store and they had to plunk down fifty dollars for their prescription.

**Burns:** So you see consumers as actually being more cognizant and appreciative of the impact that some of these devices have had on their lives and the lives of their family members?

**Brown:** I think so. Part of it is that a high-cost device is a one-time incident, whereas pharmaceuticals are recurring, long-term costs. For example, with today's advanced devices, there is a good chance that a patient's hip or knee will last them the rest of their life. After a fairly short recovery period, they are back enjoying an active lifestyle. Medical devices provide long-term solutions to many significant medical problems.

**Burns:** John, I want to thank you for taking the time to talk to us.

**Brown:** Thank you.

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*NOTE*

1. See G.R. Wilensky, “Developing a Center for Comparative Effectiveness Research,” *Health Affairs* 25 (2006): w572–w585 (published online 7 November 2006; 10.1377/hlthaff.25.w572); and several related Perspectives.