Juan F. Granada, MD, FACC

The interventional cardiologist and Chief Innovation Officer for CRF shares his perspective on products new to the market and down the pipeline.

What do you anticipate will be the biggest postapproval story of 2015 for drug-coated balloons (DCBs)?

I think the biggest story will be rapid technology adoption. Physicians in the United States have been waiting for this technology for quite some time. Treatment for peripheral vascular disease has been frustrating because of the limited number of clinically effective therapeutic options, especially on the drug delivery front. The fact that we have two DCBs approved now will open the possibilities for new trials, new clinical applications, and hopefully the regular use of this technology in the United States.

How do you think DCB manufacturers will or should differentiate their products from one another?

The biggest enemy of DCBs is the fact that the drug is put on the balloon dilatation device's surface. What does that mean? Well, the biggest enemy of balloon angioplasty is suboptimal angiographic results—dissections following balloon inflation, vascular recoil, and abrupt vessel closure—so one of the main differentiators of these technologies in the future will be how unique the balloon dilatation catheter technologies are. This is where dedicated platforms designed to produce optimal angioplasty with the least amount of dissections and vascular complications would be essential. That includes low-profile balloons and high-pressure balloons in some circumstances to overcome calcium.

Do you believe there is there increasing importance placed on the preclinical testing stage of device development? If so, is this true of all device types or more so with drug-eluting therapies?

This is important across the board. At the very beginning of the era of medical device development, experimental testing was reserved as a kind of safety phase that companies had to have before they would do human clinical studies. Nowadays, with programs becoming more expensive to develop and technologies being more challenging to take into the human clinical arena, translational research has become one of the most important critical components of medical device development. It is perhaps the most important part for the successful completion of these developmental phases. In the current environment, you only have a few opportunities to get it right. In the past, companies could actually afford lengthy comprehensive experimental programs. Right now, there is no room to fail. That is why translational sciences and having good partners in translational research have become essential for these programs' success.

In what ways have preclinical testing strategies developed to be more accelerated in recent years? Has this led to faster regulatory approvals?

The regulatory process remains the same; I don't think we are facing a more expedited regulatory process right now. I think companies are trying to develop smarter and more efficient research strategies to get into human clinical studies by streamlining experimental findings and clinical-regulatory requirements.

Medical device companies are becoming more thoughtful about the entire development process. Before, we would go and do experimental studies, and we would look to see what the results were, and if it failed, we would go back again to the bench. Now, people are really looking at these processes as comprehensive programs and analyzing the needs from bench to bedside. There is closer collaboration with clinicians and academic centers, but perhaps the most important strategy is the integration of the nonclinical validation phases with the first-in-human data, taking into consideration the global regulatory needs. It is quite expensive if these development programs fail. If you do testing in a way that makes sense and it's efficient, you can save money and get to the finish line with a very good device in your hands.

Do these hurdles have a stifling effect on innovation?

It is interesting right now because investment in innovation is based more on the capabilities of the team to execute, rather than the great idea that the team is bringing to the table. The great ideas were funded before in a way that when people brought great ideas to the investment community, everybody was excited, and they got funding. But right now, execution and understanding the regulatory environment and development path is more important in gaining funding.

There is absolutely a clear impact on innovation, but right now, there has to be a very thoughtful process and different alternatives for device success and failure for these ideas to get funded.

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What technological advancements are you most excited to have access to in the United States in the future?

There are many areas in which we are seeing very dynamic and aggressive development. The first, which is not brand new, but I see it approaching the United States' clinical arena, is bioresorbable scaffolds. We are learning more and more about the biological capabilities and differences of this technology. It will not be a mainstream therapy for everybody, but I think if the data continue to show positive results, this technology could change the way we treat patients undergoing percutaneous coronary interventions.

There is a very important exponential phase of maturity of TAVR with the adoption of percutaneous aortic valve replacement. More exciting is the growth in mitral replacement technologies, with significant investment and enthusiasm going into the development of several approaches. This is an arena we've been trying to get into for the last 15 years, if not more, and I think the mitral field is going to explode within the next 5 years or so.

There are a lot of new products in testing out of the United States in the field of acute myocardial infarction treatment, especially circulatory support devices for high-risk populations and myocardial protection and regeneration. This field is very active. It's really intense.

Do you foresee the increasing consumerization of health care (eg, patients' use of wearables and apps) affecting the vascular interventional field?

Absolutely, and it's extremely relevant to what we do. If you look at how the innovation process has changed in the last 20 years, we're moving from disease-specific innovation (meaning, you have an obstruction, and we need to open it) to outcome-based innovation (meaning, you can open the blockage, but can you keep the patient alive, asymptomatic, and out of the hospital?).

In order to do that, we need to monitor disease progression and the efficacy of therapy. The only way to do that is if we actually monitor patients, so we will need to have access to technologies that allow patient monitoring on an outpatient basis. I anticipate not only an explosion of wearable devices for monitoring of disease and therapy, but also a potential increase of implantable monitoring devices for the status of disease progression and device performance. Some companies are working on concepts for monitoring devices that are implanted inside of the prosthetic or implantable device to be able to monitor the longevity and functioning capabilities of these devices.

I really think telemonitoring of the patient at the device level or disease level will be huge in the next 10 years.

Johnson & Johnson recently made clinical trial data on its medical devices and diagnostic tests available to outside researchers. Do you think this level of transparency will become a trend in the medical device community?

It's a positive step forward. One of the things that, in a way, limits the credibility of the data generated by industry is the fact that studies are designed by industry, run by industry, and sometimes reported by industry despite the fact that clinical investigators are deeply involved. I really applaud the approach that they have taken in terms of sharing the data and giving access to independent investigators to analyze the data and being able to publish the data from their own perspectives as well. I think this degree of transparency is needed, and it's a good approach. What would be even more interesting is if this type of transparency could potentially be achieved utilizing independent investigators in the studies' early design phases.

What are the Cardiovascular Research Foundation's Skirball Center for Innovation's main goals and projects for 2015?

One of the main objectives for the Skirball Center for Innovation is continuing the development of strategies to make the innovation process more efficient. We continue to make a lot of efforts in developing strategic partnerships to take early stage technologies from the experimental phase into first-in-human clinical studies.

We have several programs that are entering first-in-human clinical studies this year that we have been guiding over the last 2 or 3 years. Also, our goal is to be able to take all the lessons we have learned from studies outside the United States and start using the early feasibility phase for more first-in-human studies in the United States. I think it would be a dream for all of us to be able to start doing this type of study in the United States.

We also want to continue the expansion of our global interconnectivity in innovation. We have great partnerships in India, China, and Europe, and through all these channels, we continue to support innovation in the United States, which is our main focus. ■

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