



# A new vision of the heart

Interview with Carlo Pappone, MD

Magnetic Assisted Intervention (MAI) is signaling a brighter future for both patients suffering from arrhythmia and the doctors who use ablation therapy to treat them. In the following interview, Dr. Carlo Pappone of the San Raffaele Hospital in Milan, Italy, a world-renowned specialist in this area of cardiology, speaks with AXIOM Innovation in Intervention about this new technology's potential to increase workflow efficiency and help develop improved methods of treatment for atrial fibrillation.

**AXIOM:** "Dr. Pappone, an AXIOM Artis magnetic navigation system was installed in combination with the Stereotaxis Niobe® II system at the San Raffaele Hospital in April 2005. Why did the hospital decide to install it, and what has your experience been to date?"

Dr. Pappone: "We decided to install this system because it represents not only a new technology, but a new vision of medicine. We are using it at present in ablations to treat atrial fibrillation (AFib). For the first six months, I used it myself while my

colleagues watched. I had to learn the language of the system, and it had to get used to me. In general when you acquire a new technology, you have to spend time learning about it, becoming familiar with it. But this system knows virtually everything! It taught me. It has helped me use my hands better. It taught me to do things that I would never have dreamt of doing before.

To guide a catheter through a labyrinth such as the heart takes a great deal of experience, and this system makes it much easier. Before magnetic navigation, ablation surgery was like riding a bike in a labyrinth, without handlebars. To maneuver, we could only push and pull, and it took a lot of skill to make the catheter go where we wanted. Now we can actually guide the catheter. However, you must have experience working with your hands because this technology is not a substitute. It perfects what the hands are capable of doing. Now doctors can focus on using their brains rather than their hands. This system helps people who know what they want to do, but may not be extremely skilled with their hands. The more experience you have, of course, the better you are able to control the system."

**AXIOM: "In the meantime, have your colleagues become as convinced of the value of the system as you are? And how are you using the system at this point?"**

Dr. Pappone: "Between April 2005 and May 2006, we treated approximately 680 patients with this new system. Nine of my colleagues are using it along with me. Five percent of everyone over the age of 60 has AFib, and half of these patients cannot be successfully treated with medication. They require ablation, but there aren't enough doctors trained to handle this intervention. It takes too much time to learn the technique. It took me ten years. I can do this procedure now in 45 minutes, with the new system,

but that is because I have done about 11,000 ablations. My colleagues would normally need three hours, but with the new system, they have reduced their time to 90 minutes. Atrial fibrillation may be caused by aging or by congenital problems, such as Wolff-Parkinson White Syndrome, which occurs in one of 1,000 individuals. I have done about 500 operations on patients with WPW Syndrome. With this technology, you can identify the specific area where the problem arises and correct it definitively. The system can also be used for muscular problems of the heart and heart failure."

**AXIOM: "So are you saying that your expectations for AXIOM Artis have been fulfilled so far?"**



Dr. Pappone: "Far beyond what I had expected! I didn't expect to improve my knowledge, manual capability, and way of thinking so much."

**AXIOM: "What do you see as the main advantage of MAI?"**

Dr. Pappone: "We have many patients, but few doctors to treat them, and not enough time for each patient. A doctor today is selling his/her time and know-how, not a specific operation. This technology allows doctors to use their time better and to do

## Joint Development for Innovation Leadership

AXIOM Artis dFC Magnetic Navigation with Niobe® II is a joint development of Siemens Medical Solutions and Stereotaxis Inc. Since 2001, we have been working in close cooperation with Stereotaxis to ensure a seamless integration of the Niobe® II magnetic navigation system with AXIOM Artis cardiology systems.

**"It taught me to do things that I would never have dreamt of doing before."**



Carlo Pappone, MD, is the head of the arrhythmic unit of the cardiology department at the San Raffaele Hospital in Milan, which is considered one of Italy's top hospitals. Dr. Pappone is one of the world's most experienced surgeons for the treatment of atrial fibrillation by ablation. In May 2006, he performed a real-time live ablation on a patient who was almost 4000 miles away using AXIOM Artis magnetic navigation. Dr. Pappone is an honorary member of leading cardiology societies and serves on the boards of the top cardiology journals in the US. He received his medical degree from the University of Naples in 1986. In 1991-92, he did electrophysiology training at the Universities of Michigan and Oklahoma, and he earned his PhD from the Università "Tor Vergata" of Rome in 1995.

more things within a limited time frame. In my case, an ablation may take the same time regardless of whether I use the new system or the traditional method, but the new method is more precise and less fatiguing. I can do the operation while sitting at my desk, talking to my secretary, answering the phone. And I can do all this with greater precision than in a traditional setting. My physical presence in the operating room isn't needed anymore."

**AXIOM: "Have you also increased the efficiency of your lab with the magnetic navigation system, and if so, how?"**

Dr. Pappone: "We have absolutely increased the efficiency of our lab. We use the system five days a week from 8 am to 7 pm and have never had a moment's down time. And we have doubled the number of ablations performed – from five to ten interventions per day."

**AXIOM: "In your latest article in the Journal of the American College of Cardiology (JACC), you describe the advantage of better wall contact of the magnetic guided catheter, especially in the valve area, where the movement of the valve can lead to incomplete lesions using conventional ablation catheters. Do you expect that ablation therapy of atrial fibrillation with magnetically**

**guided catheters will lead to better long-lasting success rates than conventional ablation approaches?"**

Dr. Pappone: "Yes, for most doctors. My personal success rate is 90 percent, which hasn't changed with this system. But that is because I have a great deal of experience.

We navigate in real time, with the heart beating. It is difficult to synchronize the catheter with the movement of the heart tissue as it pumps. Even if you have very good hands, you are still required to synchronize second by second to account for this movement. With magnetic navigation, the contact is much more precise and stable. So when we transfer energy to the tissue, we transfer 100 percent of the energy. Nothing is lost.

The system accelerates the learning curve, the quality of the lesion set, and the ability to transfer the energy to the tissue. It improves the accuracy of reconstruction. In the past, each of these points required three to four years of experience. The system creates the conditions for less experienced doctors to perform complex procedures that were formerly only possible by extremely skilled surgeons. However, as I said before, it is not a substitute for hands and brain."

**AXIOM: “In the JACC article, you also point out the importance of the integration of the mapping and the navigation system. What do you think about the integration of the AXIOM Artis imaging and the Niobe® navigation system?”**

Dr. Pappone: “The integration is seamless. Considering the short time Siemens Medical Solutions and Stereotaxis have been in the field, they have achieved a very high level of integration. At first, we needed to understand how the system was synchronized, but now, for the very first time in our field, it is possible to synchronize the navigation. In the future, we could do much more.

We could apply a camera to the end of the catheter and take photos of the human body from the inside – pictures of the intestines, for example. We can already take pictures of the human body from the inside today, but they aren’t guided. With this system, we could control where the camera goes.”

**AXIOM: “Do you intend to buy more magnetic navigation systems for your other EP labs?”**

Dr. Pappone: “We are thinking about buying another system and linking it to the CAT (computed axial tomography) equipment so that, as soon as a patient has a CAT scan, we could operate immediately. Next year, we want to build a special room for a remote system that one can operate from anywhere in the world via a satellite linkup. This would expand our capability to treat patients. It would be used as a support for training, backup for complex operations or to actually perform the procedure. We have five workstations in our department. We can use ISDN, IP or satellite. We have already used ISDN and it has worked perfectly. We did a remote operation when I was in Boston and the patient was here.”

**AXIOM: “And it was successful?”**

Dr. Pappone: “It was a complete success!”

**AXIOM: “Can you think of anything about the system that could be improved?”**

Dr. Pappone: “The catheter needs to be improved. Today, we have only 4 mm catheters. New 8 mm catheters are coming on the market in August that can make deeper, wider lesions, and cooled catheters will be available in late fall. They will enable this system to perform at 100 percent of its capabilities. As more physicians can use this technology, more catheters will be used. Voice control will be another improvement. That should happen within the next five years.”

**AXIOM: “How else do you think magnetic navigation might change the face of the future for cardiology?”**

Dr. Pappone: “The most extraordinary thing made possible by this technology is that it gives us new hope for the world. In developing countries, many thousands of children die of heart problems that could be cured with a five-minute ablation, but it’s not possible in poor countries. It’s too expensive and the know-how isn’t there. Doctors with the know-how to perform these ablations live in industrialized countries. The technology now makes it possible for them to apply their knowledge from a distance. The system should not be seen simply as a new technology, but rather as a new vision for the democracy of science. Therapeutic telemedicine is the future and will enable us to treat everyone, everywhere in the world. Today, telemedicine means transmitting data and images and consulting, but it can also mean treating patients from afar as well as accelerating the level of learning of physicians.”

**For more information, send your questions to: [hans-joachim.reich@siemens.com](mailto:hans-joachim.reich@siemens.com)**



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