

**THE AFIB REPORT**  
**Your Premier Information Resource for Lone Atrial Fibrillation**  
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## **VIRTUAL LAF CONFERENCE**

Proceedings of Ninth Session  
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### **SUBJECT: ABLATION & RADIATION EXPOSURE**

Time to twist our brains with a new subject.

Catheter ablation procedures use fluoroscopy to help the surgeon see what he is doing when guiding the catheters to the heart and when moving them around in the heart itself.

Fluoroscopy is a technique for obtaining "live" x-ray images of a patient. An x-ray beam is transmitted periodically through the patient and strikes a fluorescent plate coupled to an image intensifier which in turn is coupled to a video camera which relays the picture to a video screen watched by the surgeon. The surgeon, assistant and staff in close proximity to the operating table wear lead aprons to protect themselves from the x-ray radiation, but what about the patient?

Clearly the aim is to keep the fluoroscopy time as short as possible during the procedure so as to minimize radiation exposure to both patient, surgeon and staff. It would seem that again, operator experience is crucial here. A recent report from the University of Michigan cited a fluoroscopy time of 104 minutes for a relatively inexperienced surgeon and 48 minutes for an experienced one (1). Clearly a very significant difference. The UoM report also contained the statement:

"Long procedure durations and large amounts of radiation exposure may currently limit the widespread application of this therapy [pulmonary vein ablation]."

Professor Haissaguerre and his group in Bordeaux claim an average fluoroscopy time of 57 minutes while the Cleveland Clinic reports 110 minutes with the 4 mm catheter tip and 51 minutes with the 8 mm tip (2,3). So what does this mean as far as radiation exposure to the patient is concerned?

The Bordeaux group determined patient exposure to be an average 1.1 mSv (milliSievert). One mSv equals 100 millirem. Dr. Perisinakis and colleagues at the University of Crete reported an average exposure of 5.7 mSv (8.3 mSv per hour of fluoroscopy (4).

Just recently, Brazilian researchers reported an average 298 mSv exposure during a 3-4 hour PVA procedure (5). This seems extremely high and I am in the process of verifying it with the authors of the report.

Other researchers report that radiation exposure can vary widely depending on operator experience with fluoroscopy, on the design of the shielding surrounding the operating area and on

whether continual or pulsed fluoroscopy is used (6,7,8).

So, is the ablation procedure safe and reasonably devoid of long-term consequences as far as radiation exposure is concerned? Dr. Perisinakis estimates that 60 minutes of fluoroscopy time (exposure: 8.3 mSv) would result in an excess of 650 cases of cancer per million patients undergoing RF ablation (4). Is this realistic? I really don't know. However, with our combined brainpower of physicists, engineers, MDs and other luminaries contributing to the LAF Conference Room we ought to be able to find out.

The Canadian Centre for Occupational Health and Safety has set an annual maximum exposure level of 1.0 mSv for the general public (9). A CT scan produces a radiation exposure of about 1.1 mSv and the US National Council on Radiation Protection and Measurements (NCRP) limits the annual whole body OCCUPATIONAL exposure (head and trunk) to 50 mSv (2).

Over and out!

**Hans**

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- (8) Scanavacca M, et al. Reduction of radiation exposure time during catheter ablation with the use of pulsed fluoroscopy. *International Journal of Cardiology*, January 5, 1998; 63(1):71-4
- (9) [http://www.ccohs.ca/oshanswers/phys\\_agents/ionizing.html](http://www.ccohs.ca/oshanswers/phys_agents/ionizing.html)

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Hans - This news isn't good.

I would hope there would be at least a shield for the thyroid and also for the reproductive organs for younger people. But that is the very least of the consideration you've mentioned here. We tend to go to great lengths to avoid radiation in any form and while I understand the importance of this surgical "tool" I'm very disturbed about the long-term consequences.

Truly, I have to do much more thinking about why there is no protection for the patient.

I'm tending to think that again, greed prevails. Do the procedure, protect ourselves, never mind about the patient....

I'm alarmed and disgusted.

**Jackie**

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Jackie if I was having an ablation I would research about Potassium Iodide it will at least protect against getting thyroid cancer.

From Medline : The effectiveness of KI as a specific blocker of thyroid radioiodine uptake is well established. When administered in the recommended dose, KI is effective in reducing the risk of thyroid cancer in individuals or populations at risk for inhalation or ingestion of radioiodines. KI floods the thyroid with non-radioactive iodine and prevents the uptake of the radioactive molecules, which are subsequently excreted in the urine.

<http://www.nlm.nih.gov/medlineplus/radiationexposure.html>

Take care ....

**Ella**

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Hans,

According to your post, radiation exposure is as follows:

1.1 mSv Bordeaux group average ablation patient exposure.

1.1 mSv Radiation exposure for a CT scan.

What is the problem? I have never heard claims made that a CT scan causes excess amounts of radiation exposure. CT scans are relatively routine and not controversial.

Additionally, the NCRP limits annual wholebody exposure to 50 mSv (about 45 times as much radiation exposure as received in a French ablation). An ablation's exposure is a tiny percent of what the NCRP allows. What is the problem? Or am I missing something?

**Newman**

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Am I correct in thinking that a new through the chest wall (laparoscopic) technique recently discussed here and designated a RAMA (robotically-assisted something or other) actually avoided the need for catheterisation? And therefore for radiation exposure? Or am I talking rubbish (-:

**Mike F.**

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Mike,

You are definitely not talking rubbish. The procedure is called a robotically assisted minimally invasive microwave ablation, is being done as we speak at two locations in New York City and does not involve catheterization. The two docs in New York are Dr. Michael

Argenziano at Columbia Presbyterian and Dr. Didier Loulmet at Lenox Hill. I have met with both of them and the technique is well worth considering.

### **Kerry**

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Newman,

You are absolutely right. If you have your ablation at the Bordeaux Clinic or presumably at any other world class center you should be safe as far as radiation exposure is concerned. However, not all ablations by a long shot, are done at world class centers. One of the reports I read on the subject described a case where a team of fluoroscopy experts went into a hospital and by properly adjusting the equipment were able to reduce radiation exposure to less than 1% of what it had been before they adjusted things. Also, the Brazilian report (which I am still trying to verify) quoted a radiation exposure almost 300 times that quoted by the Bordeaux Clinic. And by the way, the 50 mSV maximum allowable annual exposure is for people working with radiation equipment (OCCUPATIONAL exposure). Don't ask me why they can tolerate more, I haven't a clue :-). The maximum permissible level for the general public is around 1-5 mSv depending on country.

Anyway, what I would do if I were contemplating an ablation would be to ask the EP/surgeon "How much radiation will I be exposed to during the ablation procedure?" If the answer is somewhere along the lines of "That will depend on how long the procedure takes and how difficult your particular case is, but I would estimate somewhere around 1-2 mSv (100-200 millirem)" then I would feel quite reassured. However, if the answer is a blank look or "Oh, don't worry about that, we keep it as low as possible" then I would look for someone who was aware of the potential problem, had looked into it and could give me a definitive answer.

### **Hans**

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Jackie wrote

"I'm tending to think that again, greed prevails. Do the procedure, protect ourselves, never mind about the patient...."

I think the reason they protect themselves is pretty straight forward - they do many of these procedures - the patients are only there for one or two. It would be interesting to know what the doctor's yearly exposure was - I wouldn't be surprised if it was higher than an individual having an ablation.

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### **James D**

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James,

The Bordeaux clinic gives the average surgeon exposure (inside the lead apron) during a pulmonary vein ablation as 0.002 mSv and that to the nurse as 0.003 mSv. So the surgeon receives about 500 times less radiation exposure than the patient. If the surgeon does 200 procedures per year he'll receive 0.4 mSv total exposure for the year; less than half the amount the patient receives - and the surgeon spreads this over a full year whereas the patient receives it all within a period of a couple of hours. If a nurse attends 200 procedures per year she'll receive only about half the patient's exposure.

The Brazilian numbers are quite different: 298 mSv for the patient and 0.04 mSv for the surgeon at the level of the abdomen and 0.26 mSv in the face. So the surgeon would receive about 7000

times less radiation than the patient at the abdominal level and about 1100 times less in the face. Total exposure for 200 procedures would be 8 mSv at the abdominal level and 52 mSv in the face; that is just above the annual occupational limit of 50 mSv. I do think I would give Sao Paolo a miss for now as far as an ablation is concerned.

Anyway, I still believe due diligence is in order in this area particularly since quite a few afibbers have needed follow-up ablations which could almost double the exposure.

### **Hans**

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Hans - thanks for this information.

Somewhere in my vast assortment of files, I have the guidelines for allowable dosage of radiation accumulation - and I believe it is X number of Rads in a lifetime...

Do you have that info and if so, how does the mSv number(50) you are quoting equate with the Lifetime Rad limitation?

Or are we comparing apples and oranges here?

I know that with radiation for cancer treatment, they can only go up to the lifetime limit of exposure.... and they get there rather rapidly.

I'm trying to drag that out of my memory and either 6 or 8 RADs keeps coming up, but I could be way off. Long time since I had to think about these details... but I guess everyone should be aware just in case.

Thanks..

### **Jackie**

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James D.

Perhaps my comment was not exactly clear. I know why the operators need protection. I worked with radiation myself for 25 years. We were very cautious about our own accumulative exposure, but additionally, we went to extra lengths to make sure that the patients were never exposed to any more radiation than necessary... We always used body shields and a thyroid shield. We always were very protective of children. I worked temp in other offices that did not provide shields – takes too much time – even though it is considered standard of care.

I have argued and fussed with other medical facilities when I have x-rays about having a shield for the body parts where the x-ray beam is not penetrating. Amazingly, the technicians always have shelter, but frequently, no lead-lined apron or thyroid shields are available for the patient's protection

My comment about greed is exactly that - get the patient in and out – and don't spend any time making sure they have the ultimate care or concern about radiation exposure. This is common.

Hans points out the attending professionals receive far less radiation than the patient – which is good for the professionals– and if I were the professionals, I would be extremely concerned about personal cumulative exposure. The eyes and surrounding area are not protected and neither is the head... scatter radiation abounds everywhere. These professionals are placing themselves at

high risk for consequences later down the road. OSHA probably has guidelines. But patients don't have OSHA protection.

However, the point I make about the patient is valid....it may only be one time, but it isn't the only xray exposure patients typically receive. We all accumulate quite a bit in a lifetime from just the environmental exposure alone – flying, etc. Plus the dental and other surveys that have become routine over the years.... I know that when I have a mammogram, I always cringe when that apparatus positions my neck (thyroid) right on the shaft that comes down with the focus on the breast plate. That can't be good and they never offer a thyroid shield – in fact – don't have one. (and I am hypothyroid.)

So to make myself clear.... The professionals do have an obligation to the patient to make sure they are protected... it would probably be cumbersome but nonetheless important. Have they considered the possibility? I don't know. However, now that Hans has enlightened me, I will surely find out more.

Whether or not one is having ablation, extra doses of radiation should be of concern to every living person.

Respectfully,  
**Jackie**

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Point taken Jackie, thanks for the clarification and thanks Hans for the info on Doctor exposure.

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**James D**

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I should have posted this on a previous thread on ablation; too late so here it is.

Another consideration with ablation – Lengthy but important information

During my consult with Dr. Natale, he said he places patients on a 3 months course of Lipitor since it has been shown to reduce inflammation and he feels, helps with healing. Hans has covered the anti-inflammatory properties of statins such as Pravacol in his book on page 134 of his book.

Personally, I have a big problem with statins – for 2 reasons. 10 years ago, sustained permanent muscle weakness (legs) from about 3 months on Pravachol. The MD at the time said it was my imagination but changed anyway to Zocor. No improvement – nor has it improved since.

Lipitor is a new generation drug in the statin family and is much more powerful and highly effective. It's been prescribed for about four years.

In a preview of his book and in a talk at a recent convention on Cholesterol, retired Astronaut and Medical Doctor Duane Graveline, MD, MPH addressed his experiences with the statin drug, Lipitor. Now aged 72, he flew in space in 1965 as a US Air Force Flight Surgeon and research Scientist. He is the inventor of the lower body pressure device used on Mir, Skylab and the ISS for assessment of cardiovascular deconditioning while in space.

The title of his talk is "Lipitor, Thief of Memory" and his book will also be that title, with a subtitle of "Statin Drugs and the Misguided War on Cholestrol.". Dr. Graveline (pronounced Gravlyn) read a carefully scripted one-hour presentation which was screened by his attorney because apparently Merck would love to shut him up. He has been presenting his personal experience with a side effect of Lipitor for about one year.

The story is long and fascinating as well as alarming. Briefly, during one of his routine post-retirement physicals given all retired astronauts, he was prescribed Lipitor to lower his cholesterol. Six weeks later and without warning, he experienced a 6-hour episode of Transient Global Amnesia (TGA). After he recovered, he immediately suspected Lipitor because this was the only change he had made and the package insert indicated “possible memory problems” as a side effect. A detailed examination of his brain and nervous system checked out normal.

He remained off Lipitor for a year and again at his next annual physical, the attending physician prescribed Lipitor but at half the previous dose. He agreed and six weeks almost to the day, his wife noticed he stopped washing the car and was wandering aimlessly around the driveway. He had no idea who she was nor where he was.

He eventually was persuaded to go to the hospital and about 12 hours later he began to recover but could not remember his wife, children, grandchildren or going to medical school or the 8 books he wrote – and scoffed at the idea of being a Medical Doctor and Astronaut. In time, and with his wife’s help, he began to remember while she introduced the family with photos, news-clippings, marriage license, and medical books. But, he still couldn’t remember how to practice medicine. Eventually, with a lot of reading of the medical books, his mind snapped back to normal. He hasn’t taken Lipitor since.

Over the past 2 years, he has worked with NASA doctors as to the cause of his TGA and they tell him Lipitor was not involved with his problem. Fortunately, one doctor came to his aid. She was a researcher in a Statin Study and reassured Dr. Graveline he was not alone in the “black hole” of significant cognitive defects from statin drug use.

In March 2002, he wrote to Teresa Graedon – the People Pharmacy syndicated columnist published in several hundred newspapers. He gave a brief description of his TGA problem with his Lipitor use and they responded by saying they were not aware of any similar problems but published his letter of inquiry. Over the next few days they received hundreds of emails of other cases. Reports are still flowing in today and measure in the thousands.

Dr. Graveline says he is now influenced by the research work of Uffe Ravnskov, MD, PhD, (author of *The Cholesterol Myth*) Paul Roch, MD, Kilmer McCully, MD, PhD, Peter Langsjoen, MD, FACC and Mary Enig, PhD (fat and oil researcher) and says the real culprit of heart disease is not cholesterol but rather, homocysteine.

Dr. Graveline’s crusade against prescribing Lipitor is based on his personal experience that Lipitor has a dangerous side effect where otherwise healthy people are turned into people with diminished cognitive function and who are unable to formulate new memory.

He reports the case of a powerful CEO of a large corporation who is now unemployable because of TGA and Lipitor. He further explains the importance of cholesterol in cell membranes and for the manufacturer of essential steroid hormones vital for body function.

He endorses Kilmer McCully’s Homocysteine position that the true culprit in atherosclerosis (and heart disease) is homocysteine and not cholesterol. He recommends reading McCully’s book – *The Homocysteine Revolution*

He says thousands of adverse effects has been filed with the FDA Med Watch and thousands more are pouring in over the last several years but the FDA and drug companies are reluctant to issue a report warning of TGA. (How would doctors explain to patients the drug they have prescribed is now known to seriously harm patients and create memory loss?)

TGA strikes without warning. ER’s are reporting an epidemic of TGA cases. Because of under reporting by patients who chalk it up to senior moments and old age, many, many more cases are out there.

The side effects are all but buried in the lengthy list in package inserts – but it says to expect and report any amnesia attacks, increasing confusion and failing memory.

**IT APPLIES TO ALL STATIN DRUGS.**

I'd hate to lock horns with Dr. Natale over this but it could become a very important issue in my treatment.

Think about it. Let me know your opinion.

(If you Google any of these names, most have a web site or will link to some bios. Dr. Graveline's bio is interesting. He's quite a guy and definitely not a quack.)

***Jackie***

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Hi Jackie,

Thanks for this post. I had no idea about lipitor, and because of this I would most probably opt to NOT take lipitor after the ablation, tell Dr. Natale of my concerns before the procedure & ask about healing process without lipitor.

Thanks again,

***Jim W.***

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Hans,

When I read what the Brazilian researchers are reporting, it makes me wonder what type of equipment they are using and how old it may be. Are they using pulsed fluoroscopy? Probably, most definitely not. From what I have been reading, with pulsed fluoroscopy, radiation exposure is reduced to much lower levels than with continuous fluoroscopy. I'm sure this is what the French are using, along with all of the major centers here in the US.

Also I would like to know what type of fluoroscopy Dr. Perisinakis was using, continuous or pulsed? 8.3mSv/hr of fluoroscopy, if continuous, would be greatly reduced if the fluoroscopy was pulsed.

***Jim W.***

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Jim,

The Brazilian team used pulsed fluoroscopy (7 frames/second). The Perisinakis team used continuous fluoroscopy. It is interesting that Dr. Scanavacca, the lead author of the Brazilian study was one of the first to report the benefits of pulsed fluoroscopy (Int. Journal of Cardiology, 1998).

I wonder if anyone has investigated what the radiation exposure is during a typical procedure at the Cleveland Clinic.

***Hans***

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Hans,

I will investigate what the exposure is at the CC and report back ASAP.

**Jim W.**

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I also worked briefly as a radiographer a decade or so ago and I just want to point out a few things. During training you would be failed for not providing proper shielding of patients. This is a very diverse group so I don't know where you are but in the USA (NJ at least) lead shielding MUST be available and used. The older you are the slower your cell divisions are taking place so radiation is much more of a concern in the very young than the very old. Why on earth should a physician put himself at any risk to bring us this cure? Remember we are the ones with the problems. Finally I can't say this loudly enough-- it is OUR responsibility to DEMAND certain things from our doctors or anyone else we pay for services. I demand lead shielding when possible. Sometimes it may interfere with certain procedures. I will not allow ROUTINE x-rays to be taken. If you tell me what you hope to find I will weigh that against the exposure and base my decision on that. We can't be timid sheep when it comes to our healthcare it is our lives we are talking about.

**Kevin**

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Kevin - You are absolutely right. We do need to be assertive and DEMAND protection.

However, although it is law to provide the lead shields - what I said was it is not always available - especially in some of the dental offices where I worked temp positions. Additionally, and even more distressing, is the lack of availability in hospital radiography settings.... Plus these people really get annoyed with a patient who "demands".

Please know that I use the utmost tact, but lose patience when I'm having an x-ray which is "required" by hospital policy and which I don't want and then they don't even have the mandatory shielding available.

I don't allow routine x-rays either and use my own judgment when it might be appropriate. As you say, it is my body and I'll decide.

But, I want to tell you, I've been in some pretty intense discussions with nurses and doctors over my lack of cooperation.

**Jackie**

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Hans,

I will investigate what the exposure is at the CC and report back ASAP.

**Jim W.**

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Just reading Hans' breakdown of the time of exposure makes me realize that only the truly desperate AF patient should even consider a catheter based ablation. You can do all the research you want but it is wishful thinking to believe that anyone can really know the long term effects of such exposure. By the time the data is available this archaic procedure will be history. There are other techniques being worked on right now in New York City, i.e. microwave ablations done outside the heart which does not involve radiation and has no risk of stenosis. This, to me is

the wave of the future in ablations. Any person on this board who is not suffering too badly would be ill advised to have a catheter based ablation at this time, in my humble opinion.

I have heard many people on the board say that they would rather wait a year or two until the stenosis problem is under control. If a LAF patient can wait that long, then he/she can wait a little longer for other techniques that do not involve radiation exposure.

**Kerry**

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Kerry says that the RAMA is being performed at two New York hospitals. Does anyone know if it is being performed anywhere else? If it is really as good as it sounds like it might be, I would think many other centers and doctors would jump on the bandwagon and start doing them. If not, then why not?

**Newman**

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Newman,

Dr. Adam Saltman in Worcester, Mass. is performing minimally invasive microwave ablations but without the use of robotics. The company that makes the microwave probe is AFX, Inc. They may be able to provide the names of surgeons in other parts of the country who are performing the procedure. Although I don't have numbers, I would have to believe that the number of surgeons performing minimally invasive heart surgery using robotics is relatively small. And assuming a surgeon is performing this type of surgery, he would then have to elect to start performing ablations, as opposed to the more common valve and other heart tissue procedures being performed using these techniques. If I am correct in this analysis, it will take some time before you have a fairly abundant number of highly skilled surgeons performing this procedure.

Compare this to the EP's who are doing catheter based ablations. My guess is the group of EP's all over the country who specialize in this procedure probably have limited their practice just to ablations. They can't do much else with the procedures they have developed for ablations and there is so much money in it for them that there is great incentive to learn this technique and make it a major part of their practice, if not the only part.

The heart surgeons however are making a bundle performing valve repairs, etc. so they already have the incentive and plenty of business.

In any event, if the surgeons in NYC who are doing it, establish a good track record using this procedure, it doesn't concern me that there may not be others in the country who are doing it.

And of course, remember that microwave ablations have been performed thousands of times in open heart surgery all over the country. Just run a search and you will be overwhelmed with info on the procedure in general.

**Kerry**

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Kerry - Is there no incidence of scatter radiation with this microwave procedure?

**Jackie**

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I did not ask that question as I was told that there was no radiation exposure at all during the surgery. I am following the progress in New York and will update the board with further info and the answer to your question.

### ***Kerry***

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Kerry,

Regarding one of your posts dated 07-09-03 concerning exposure to radiation during a catheter ablation, you said that "... only the truly desperate AF patient should even consider a catheter ablation...". See Han's posts of 07-01-03 and 07-03-03. You will note that the radiation exposure for an ablation at the French Bordeaux group is the same as for a CT scan. Surely you don't think that only the truly desperate should have a CT scan. This is not excessive radiation.

There are risks in the battle against afib with any procedure. PVI ablations performed at the best centers have a high success rate and a very low complication rate. Additionally, the procedure is relatively painless, and most patients can be leading a normal, active life a day or two later. For those who can wait a few years, something else improve on it. As of now, it is a pretty good choice for many people.

### ***Newman***

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Newman - I totally agree. If someone needs it now; then now is the time. Just as you say, improved procedures will continue to evolve but right now people are experiencing good results and getting on with their lives.

My neighbor has had an ablation and is thrilled with her results; a deacon I spoke to recently also had ablation by Natale and he is thrilled with his results. He has his life back after some very bad times living with afib.

Thanks for your input.

### ***Jackie***

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I was first diagnosed with afib in 1994, and my episodes were paroxysmal, and I would go in and out spontaneously, and without apparent cause. I took metoprolol for several years, until the afib got worse, and I appeared to be having much more frequent symptoms. I was cardioverted in 1999, and put on sotalol. Three months or so later, the sotalol stopped working so they switched me to amiodarone. The amiodarone kept me in sinus rhythm until about April 2002, when the cardiologist noticed that I was in afib during a routine checkup. He recommended a modified maze procedure done by minimally invasive surgery, rather than ablation because he felt it had a higher success rate, and lower risk of complications for my chronic, but idiopathic afib. Since the outset there was no other heart disease, other than a mitral valve prolapse.

I had the surgery in August 2002, after agonizing and getting several second opinions about ablation vs. maze. I was back in sinus rhythm about three days after surgery, and have been there since then. The recovery from surgery was quite a challenge, but I am symptom free, off amiodarone, with its attendant semi-annual eye checkups and pulmonary function tests, and off coumadin, with its frequent blood tests. I take an aspirin every day, and do not need any anti-arrhythmics any longer.

As for the surgery, an incision of about 4 inches is made on the right side, below the armpit, between two ribs, through which all of the instruments and the camera can be inserted. Two other

very small incisions nearby were made for this purpose as well. Access to the inside of the heart is through an incision close to the junction between the atrium and the right pulmonary vein. The heart lung machine is connected through an incision in the groin area, around where the catheters for angiograms (and ablations) are inserted. The surgery I had included these two steps, although in some cases, the surgeon can operate from the outside on a beating heart, without a heart lung machine. It can also be done with a robot, although I am not clear when use a robot, as opposed to a manual approach.

My surgeon told me that the total time on the pump was only a half hour, and that making the lesions on the inside of the heart was less complicated, and more reliable, so that it was worth the trade off. Ablation from the exterior of the heart, while it is beating is less precise and therefore less reliable. The procedure involved ablation of an oval around the four pulmonary arteries to electrically isolate them from the left atrium. He was able to see what he was doing through a video camera, so no fluoroscopy was needed. A line from the pulmonary arteries to the mitral isthmus is also ablated, and the atrial appendage is sewn closed to preclude clot formation. The entire procedure takes about three hours, although much of that time is for preparation, access, and removal of the pump.

Following surgery, I was in the ICU for about three days, and was quite uncomfortable at first, because they collapse a lung to obtain access to the heart. This causes a rather painful cough. Generally, I felt as if I was run over by a truck for a few days. After that I started feeling stronger. I was discharged from the hospital about a week later, on an anti-arrhythmic, and spent a week at home resting and walking to regain my strength and stamina. I went back to work the following week for half days, and gradually increased my time in the office as I felt stronger. I would say it took about three or more months until I felt myself again.

I don't know the cost, because every last penny was paid by Oxford, but I estimate that it cost about \$50-100,000, including the surgeons fees, the ICU, the anesthesia, etc. The risks mentioned to me were death (very remote chance), stroke, which is a risk of any heart surgery, but less than a one percent chance with this procedure, and that the procedure would not work. The success rate is better than 80%, and I would say it is overall a more definitive cure than catheter ablation, and can be accomplished in one procedure, with lower overall risk. This must be weighed against the more arduous recovery that surgery involves. I would be happy to speak to or correspond with anyone who wishes to learn more about my experience. My cardiologist is Dr. James Reiffel, at Columbia, and the surgery was done by Dr. Michael Argenziano, also at Columbia-Presbyterian Medical Center. Dr. Argenziano is the chief of the surgical arrhythmia program at Columbia, and is also chief of robotic surgery.

Thank you for this website. It was a valuable source of information.

Sincerely,  
**Robert Katz**

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Robert - thanks for sharing your experience and knowledge gained. I'm sure it wasn't an easy decision - nothing that involves the heart (or brain) would be easy. It is encouraging to learn there are other procedures available with good outcomes and seemingly less risk ... although I hesitate to even write that since risk can be anywhere.

I agree, this is a wonderful source of information and contributors such as you continue to make it more valuable day by day. Thanks again.

**Jackie**

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Robert,

Thank you for sharing your experience with us. I am very happy it was successful.

You stated that the procedure had "...lower overall risk..." than catheter ablation. Jackie stated that your procedure had "...seemingly less risk...".

I respectfully disagree. Your procedure had a remote chance of death, a stroke risk similar to that of catheter ablations in the best centers, three incisions in the chest, half an hour on the heart lung machine, a collapsed lung, and an incision in the heart. The recovery required time in the ICU. Make no mistake about it. This was major surgery. It sounds like you felt awful for several days and felt bad for three or more months. All of this for a success rate the same as the major centers are achieving with catheter ablations. I submit that this procedure has more risk overall than catheter ablations, is no more successful, and the recovery is twenty times worse than an ablation, in which most patients are pretty much back to normal in a few days.

Additionally, I am puzzled why your surgeon did not use the robot. All reports on this board have claimed that this doctor is a real expert in using the robot on "RAMA" procedures, and that robot procedures are the latest and the greatest for curing afib. If that is true, why would he not use it, or at least discuss his reason for not using it with you.

Again, congratulations,

**Newman**

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I met with Michael Argenziano two weeks ago. Since performing your operation he has started doing robotically assisted minimally invasive microwave ablations and is currently running an 80% success rate with chronic afibbers. This relatively new technique for performing microwave ablations, which have been done for years, is considerably less invasive than the surgery you had but of course it was not available as a tested technique when you had your surgery (at least I don't think so).

In any event, congratulations and best of luck.

**Kerry**

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Newman - I was thinking there was less risk of stenosis - did I misinterpret what was written.... and of course, you are correct in stating there is definitely a risk with any invasive procedure to the heart...or any other surgery, for that matter.

I remember when I first said that to my cardiologist - I said something to the effect that I would want to delay ablation as long as there were other methods to keep me comfortable since it was so invasive.

He replied - oh, it's no worse than a catheterization!... My response to that was - hey, it's still surgery and it is going into my heart with surgical instruments - I think that is about as invasive as I ever want to get.... notwithstanding open-heart surgery.

Honestly, these guys - "all in a day's work." Yeah, but it's my heart and my life.

**Jackie**

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Newman,

I agree completely with your analysis. As I mentioned in my response to Robert's message, his surgeon is currently performing RAMA's, I know because I had a lengthy consultation with him two weeks ago. Robert had his procedure done in August 2002 which was the very early stages of his robotically assisted technique. He certainly would not have had any data on the success rate. It sounds like he did mention the procedure but was probably not as confident about it as he is today (although it is still relatively early in the process)

In addition, I spoke (by coincidence this afternoon) with the other surgeon in NYC who is performing the exact procedure. I had met him when he had only performed one procedure. He has now done five and all have maintained NSR since the surgery. I don't have the details as to current medication levels and lengths of NSR for these patients, but I am continually following up with him and Argenziano and report to the board on their progress. You are correct that this procedure is infinitely less risky than the modified maze described by Robert. There is no heart lung machine, the heart is not cut in any way, no radiation, no sewing, etc. The recovery time, from what I have been told is a breeze compared to what Robert went through, the biggest issue being the soreness from the small incisions made in the rib area to allow access for the instruments and recovery from general anaesthesia. Probably about the same as a catheter based ablation.

**Kerry**

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Kerry,

Thanks for all of your info on RAMA. It has my attention and I definitely am interested. Please continue to keep us informed.

**Newman**

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Kerry,

Would you please post the telephone numbers of these physicians in NYC?

Thanks in advance,

**Jim W.**

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Hi Everyone,

Hans, thanks for this subject and causing me to think more about it.

I have finally talked with a physicist at the CC, Dr. Rick Layman who works with a Dr. Davros (ext. # 41153) who is head of radiation protection or radiology-not sure which. Rick was overly nice and will send me information regarding the equivalents of mSv, rads, and how much we get just by living our lives. He is in the middle of taking his boards now, but will send this information sometime in August. Anyway Rick says that for 50 minutes to an hour of fluoroscopy during an ablation a patient would receive approximately 100-200 millirems, possibly more if you are a "big" person.

I believe that people working with radiation are allowed more mSv simply because they are around radiation equipment and will be exposed to more radiation than the average person. An acceptable limit for these people seems to be 50 mSv. Because of working with this equipment it

isn't reasonable to expect only 1-5mSv as for the general population. Apparently, 50 mSv is fairly safe, and these persons are obviously aware of the risk if this number should go above 50.

**Jim W.**

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After all of the posts, I have tried to use them as a perspective to try to come to a conclusion on the radiation danger as a result of an ablation. My conclusion is that there is no need to worry.

The U.S. National Council on Radiation Protection and Measurements limits the annual whole body occupational exposure to 50 mSv. They must have decided that that is a safe level. Patients get 1.1 mSv during an ablation at the Bordeaux Group on average. A CT scan also results in 1.1 mSv. Unless I am missing something, ablations and CT scans cause only two percent as much radiation as is allowed occupational workers, which is considered safe. Since occupational workers and ablation patients are all human beings, the patients should be very safe if they go to the best centers.

Note: I paraphrased Han's post above.

**Newman**

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I contacted Dr. Laurent Macle, the lead author of the Bordeaux Clinic study on radiation exposure during ablation regarding the following questions:

"As I understand it the average annual radiation exposure from medical procedures is around 1.0 mSv[6] and a CT scan produces a radiation level of about 1.1 mSv. The Canadian Centre for Occupational Health and Safety has set an annual maximum exposure limit of 1 mSv for the general public. As you point out in your paper the National Council on Radiation Protection and Measurements (NCRP) limits the annual whole body occupational exposure (head and trunk) to 50 mSv.

So, taking all this into account it would seem to me that the Bordeaux patient exposure level of 1.1 mSv would be quite acceptable whereas the Sao Paulo level of 298 mSv poses some serious problems.

Adding to my confusion is a recent statement from the University of Michigan about pulmonary vein ablation[5], "Long procedure durations and large amounts of radiation exposure may currently limit the widespread application of this therapy." Are the University of Michigan researchers saying that long fluoroscopy time is a danger to the patient?

I would very much appreciate it if you could possible help clear up my confusion by answering the following questions:

- 1) Do you consider your average total radiation exposure level of 1.1 mSv to be safe for the patient?
- 2) What is the maximum level (mSv) that you would consider safe for a patient undergoing ablation?
- 3) Is there a great variation in exposure levels between institutions and surgeons performing the PVA procedure? In other words, could exposure levels really be as high as 298 mSv in some institutions?
- 4) A technical question. What is the difference between fluoroscopy time and x-ray time? Are they identical in non-pulsed fluoroscopy?"

I have now received his answers as follows:

"Thank you for your e-mail and your interest in our paper about radiation exposure during RF ablation for the treatment of AF. I agree with you that data from the literature varies a lot concerning radiation exposure during ablation procedures. For your specific questions:

In his article, Dr Knight says that large amount of radiation exposure may limit the widespread application of the technique. He is also saying that after a learning curve of >75 cases, fluoroscopy and procedure times are reduced. As I understand it, it doesn't mean that it is a danger for the patient but that there is a learning curve with that kind of procedures.

I consider that the level of radiation exposure during catheter ablation for AF is safe for the patient even if it is higher than during other ablation procedures. The level of radiation exposure during AF ablation procedures as mentioned in our paper is still below annual acceptable limit. I am also very surprised about the radiation exposure level mentioned in the abstract of Dr Scanavacca. There is a big discrepancy between their level and all the other centers. This level in my opinion would be too high for patients undergoing that kind of procedure. This amount seems unreasonably high considering their low fluoroscopy time (13+/- 2 min). More information is needed (what were the dosages from the 4 different TLDs on the patient). X-ray time and fluoroscopy time represent the same thing: the amount of fluoroscopy exposure in minutes. It is different from radiation exposure which represents the amount of radiation received by patient or staff. The amount of radiation depends on many factors: pulsed vs non-pulsed fluoroscopy (less radiation exposure during pulsed-fluoroscopy vs non-pulsed for the same fluoroscopy time), use of oblique view (increased radiation exposure during LAO), use of collimation, use of lead glass shields."

Laurent Macle MD

**Hans**

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I'm glad you didn't close out this subject yet, as I wanted to share this bit of info. I just read today in the book, "Amino Acids in Therapy".

"Brekhman reports that as part of the Soviet space program over 25,000 different chemical substances and compounds have been examined to try to discover effective protective substances against the effects of radiation. Among the standard preparations which are now issued to cosmonauts in this regard as nonspecific pharmacologically protective medicines is histidine (the only other amino acid is tryptophan). Dosages are not stated."

Brekhman, I.I., Man and Biologically Active Substances, Pergamon Press, 1980

**Richard**

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Just before my third ablation, I asked my EP about Radiation exposure issues. His reply was essentially "You won't be having a CT-scan so it's not an issue". I mentioned fluoroscopy and he simply stated that they use pulsed and so it isn't an issue.

He has been doing a few ablations a week for over 2 years so he is well over the 75 mark.

I didn't push it any further but he clearly believes that the radiation issues are related to CT-scans not the fluoroscope.

Endo-cardial Solutions have introduced the Nav-Ex catheter navigation systems and are touting

fluoroscope free flutter ablations. My EP suggested that he might use it for my last ablation but I don't think he did. I don't remember the extra electrodes being attached.

[www.endocardial.com](http://www.endocardial.com)

***Chris P***

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