

# How & Why to Read Your **O.R. Report**



## Catheter Ablation of Atrial Fibrillation



BY STEVE S. RYAN, PhD

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### ***What is an O.R. Report?***

An Operating Room report' or 'OR report', (more properly called an Operative Report) is a document produced by the electrophysiologist who performed your catheter ablation. It contains a detailed account of the findings, the procedures used, the pre-operative and post-operative diagnoses, etc.

The O.R. report of an ablation is a very technical document. Because of this, it's usually given to a patient only when they ask for it.

## *Why Request and Read Your O.R. Report*

After a successful ablation, most people are so happy to be A-Fib free that they never want to hear the word “Atrial Fibrillation” again, let alone study a very technical medical document describing their ablation.

### *How Your Ablation Changed Your Life*

However, think about how your ablation has changed your life! The O.R. report is a blow-by-blow account of your EP’s actions. It’s as close as you’ll get to understand your own ablation without actually looking over the EP’s shoulder during the ablation.

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*The O.R. report is a historical record of how you became A-Fib free.*

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The O.R. report is a historical record of how you became A-Fib free. File it way with your other A-Fib medical records for future reference

### *Was Your Ablation Less Than Successful?*

If you’ve had an ablation that was less than successful, you want to know why! Your O.R. report would show what they found in your heart, what was done, and possibly why the ablation didn’t fulfill expectations.

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*Reading your O.R. report can be very revealing...you may decide to change EPs going forward!*

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Studying your O.R. report can be very revealing. Were there complications? Was your fibrosis more extensive than expected? Did you naturally convert to sinus rhythm or were you cardioverted? Was there a problem with the EP’s ablation techniques? Or with the EP lab equipment? This information will help you and your healthcare team decide how next to proceed.

Also, depending on what you read, you may decide to change EPs going forward!

### *Whose O.R. Report is This?*

Travis Van Slooten, publisher of [Living With Atrial Fibrillation](#), graciously provided his own O. R. report from his March 5, 2015 catheter ablation. It was performed by Dr. Andrea Natale at the Cardiac Electrophysiology Laboratory of St. David’s Medical Center in Austin, TX. He and Dr. Natale have given permission to be identified by name and for the accompanying explanation.

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*For a full description of Travis’ A-Fib experience, see his blog posts, [My A-Fib Journey](#).*

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Travis had A-Fib for 8 years, but only had an episode once a year until the eighth year. Then he started having episodes every month and then quickly progressed to every week or two. His father also had A-Fib.

For a full description of Travis' A-Fib experience, see his blog posts, [My A-Fib Journey](#).

## ***When Reading This O.R. Report...***

- You may want to also read Travis' excellent article, [My Catheter Ablation Experience](#)
- My explanations are printed in *purple*
- Some readers may wish to skip ahead to the section, [Procedure Description](#). This is the section that's most important to most patients
- For reference, see [Overview of Atrial Fibrillation: How Your Heart Works](#)
- You may have to read the report two or three times before it starts coming together for you



## ***Travis' O.R. Report***

### **O.R. Report**

Travis Van Slooten, March 5, 2015

#### **Procedures** *(a list of the various actions taken during the ablation)*

Three-dimensional mapping *(3-D images of the heart are made to visualize the structure and guide the catheters.)*

Programmed stimulation with RX infusion *(Using drugs like isoproterenol to try to stimulate A-Fib which is often done after an ablation to make sure all A-Fib-producing spots are ablated)*

Transseptal access x2 *(To get to the left atrium where most A-Fib originates, doctors have to go through the transseptal wall between the right and left atrium. "2x" means they made two punctures and used two catheters)*

RF ablation for PVST (AF) *("RF" stands for Radio Frequency ablation which uses heat to make an ablation, as compared to CryoBalloon ablation which uses freezing. "PVST" stands for "Paroxysmal Supraventricular [above the ventricles] Tachycardia [faster-than-normal heart beat rate] which usually includes AF [Atrial Fibrillation].)*

Left atrial pacing/recording (*“pacing” means they used some form of cardiac pacemaker to control the rate of contraction of the heart and in particular to try to stimulate the heart into A-Fib.*)

Intracardiac (*inside the heart*) echocardiography (*Using sound waves to create moving pictures of your heart*)

Left atrial angiogram (*using X-ray to image the left atrium*)

Serial ACTs to achieve ACT 300-500 seconds (*“ACT” stands for Activated Clotting Time which is a measurement of how fast blood coagulates. Above 300 seconds is what is usually recommended during an ablation. “Serial” means ACT measurements were taken frequently during the ablation.*)

Complete EP (*Electrophysiology*) evaluation with attempted induction of arrhythmia (*as with drugs like isoproterenol mentioned above or with pacing*)

Left ventricular visualization (*In addition to studying the left and right atria, they also viewed the ventricles [the parts of the heart below the atria which pump blood throughout the body]*)

### **Pre-Procedure Diagnoses**

Atrial fibrillation that is most likely paroxysmal. The patient typically pursues early cardioversion with Flecainide as a pill-in-the-pocket approach or DCCV. (*Pill-in-the-pocket refers to a strategy where one takes an antiarrhythmic drug only when one has an attack of A-Fib. It’s used when someone can’t tolerate an antiarrhythmic drug on a regular basis. In general, like fire prevention, it’s better to keep an A-Fib attack from starting rather than trying to put it out once it has started.*) (*DCCV is short for direct current cardioversion and refers to Electrocardioversion where one’s heart is shocked to return it to normal sinus rhythm. See [Cardioversion for Atrial Fibrillation.](#)*) His episodes have increased in frequency and duration over the last year.

### **Patient History**

Atrial Fibrillation, as described above. Preserved LVEF (*Left Ventricular Ejection Fraction—how much blood is being pumped out of the left ventricle of the heart [the main pumping chamber] with each contraction. “Preserved” means the patient has a within normal range LVEF. A-Fib over*

*time often damages and reduces LVEF.) Anxiety. (A-Fib often causes anxiety, fear, depression, frustration, and anger.)*

### **ASA Score**

ASA Classification II provided by anesthesia service. *(The American Society of Anesthesiologists physical status classification. "II" refers to patients with mild systemic disease and is of minimal interest from a patient's perspective.)*

### **Anesthesia Type**

General *(General anesthesia means you are completely unconscious. Versus "Conscious Sedation" where you are moderately sedated but still conscious. Most centers use General sedation.)*

### **Patient Allergies**

NKDA *(No Known Drug Allergies)*

**Procedure Description** *(a very brief description not to be confused with the detailed description later in the report)*

The patient was brought to the Electrophysiology lab in the fasting, post absorptive state *(3-5 hours after a meal has been completely digested and absorbed)*. Risks, benefits and alternatives of the procedure and general anesthesia were explained to the patient and a written informed consent was obtained. The patient was prepped and draped in the usual sterile fashion. *(Before the ablation, a nurse will usually shave the groin area.)* Both right and left groins and the right neck were anesthetized with 1% Lidocaine and 0.5% Bupivacaine and vascular access was obtained *(puncturing the groin veins and inserting the catheter needles)* by the modified Seldinger technique *(a standard technique of using a hollow needle and guide wire to insert the catheters)* and ultrasound guidance. Surface ECG *(Electrocardiogram)* leads 1 aVF and V1 *(like getting an ECG in your doctor's office)* and intracardiac electrograms from the CS *(Coronary Sinus)*, HIS bundle *(the heart muscle cells which transmit the electrical impulses from the AV Node to the ventricles)*, and the RVA *(Right Ventricular Apex)*.

Heparin *(an anticoagulant used during ablations)* boluses *(singles doses)* 13,000 units initially were given to maintain an ACT *(Activated Clotting Time; see note above)* 300-500 sec *(seconds)*. An esophageal temperature

probe was inserted and maneuvered under fluoroscopy (*X-ray*) to monitor esophageal temperatures throughout the case. (*The esophagus lies just behind the left atrium. Doctors monitor esophageal temperature and will stop an ablation if the temperature goes too high in order to prevent damaging the esophagus.*)

At the end of the procedure, Protamine (*a drug that reverses the anticoagulant effects of heparin*) was given, sheaths and catheters were removed and hemostasis (*stopping bleeding*) was achieved with direct manual pressure. The patient tolerated the procedure well and was transferred in stable condition.

*(O.R. reports will usually list the various sheaths and catheters used during the ablation. But this information isn't important for most patients, with the exception of the new contact force catheters which significantly improve ablation effectiveness.)*

### **ICE and Three-Dimensional Mapping**

A three-dimensional reconstruction of the left atrium was created with the use of the Carto system (*Biosense Webster*). The following structures were visualized with ICE (*Intracardiac Echocardiography*). The right atrium, fossa ovale, tricuspid valve, coronary sinus, crista terminalis, RA appendage, LA, mitral valve, left atrial appendage, left superior pulmonary vein (*opening*), left inferior pulmonary vein, right superior pulmonary vein, right inferior pulmonary vein, aortic valve, left ventricular outflow tract, ascending aorta, pulmonic valve, right ventricular outflow trace and pulmonary artery. ICE was also used to guide transseptal catheterization (*passing the catheter from the right atrium through the septum into the left atrium*).

### **Transseptal**

Left atrial instrumentation was achieved by double transseptal punctures. The Baylis transseptal system was used to facilitate the transseptal punctures. Proper placement was confirmed by fluoroscopy, intracardiac echocardiography, contrast injection, left atrial pressure tracings and left atrial pressure. (*Elevated Left Atrial pressure might indicate an increased volume of blood entering the left atrium. Doctors take multiple precautions to make sure when they do a transseptal puncture that they do wind up at their target, in the left atrium.*)

LA mean pressure 14/5 (mmHG) (*“mmHG” stands for millimeters of mercury, a unit of pressure measurement*)

**Procedure Description** (*this is the full-detail ablation description*)

The patient arrived to the Electrophysiology laboratory in sinus rhythm (*not in A-Fib at the beginning of the ablation*). After left atrial instrumentation was achieved by double transseptal punctures, the circular mapping catheter was placed in all four pulmonary veins, antrums and along the posterior wall of the left atrium. During mapping, pulmonary vein potentials were noted in all pulmonary veins except for the RIPV (*Right Inferior Pulmonary Vein—often the smallest of the PVs*), which was silent. (*“Pulmonary Vein Potentials” are kind of like the charged battery in your car. Even if your car isn’t running, you can still measure 12 Volts “potential” from it. PV potentials are what EPs map and ablate, even though these potentials may not be firing and producing A-Fib signals during the ablation.*) Otherwise, mild atrial scarring was observed. (*“Scarring” usually refers to fibrosis—a fibrotic hardening of the atrial wall often caused by A-Fib and is part of the overall remodeling effect of A-Fib. Scarring/fibrosis is usually considered irreversible. It would be good to do an MRI on this patient to determine exactly how much actual scarring/fibrosis there is and to keep track of its possible progression. A successful catheter ablation which returns the heart to normal sinus rhythm usually stops this progression. See Experiments in Atrial Remodeling in Sheep.)*

The pulmonary veins were isolated at the level of the antrum (*well outside the PV openings to prevent stenosis/swelling of the PVs*) using radiofrequency energy (RF) (*heating/burning*). With ablation of the LSPV (*Left Superior Pulmonary Vein*), there was spontaneous atrial fibrillation with rapid ventricular response. Despite isolation of the pulmonary veins, the patient remained in atrial fibrillation. A roof line and an infero-posterior line were created with radiofrequency ablation for the purpose of isolating the posterior wall of the left atrium. Despite isolation of the posterior wall of the left atrium, the patient remained in atrial fibrillation. Electrograms were mapped to the left atrial septum (*the septum is a wall that separates the left and right atrium*), floor of the left atrium, and anterior roof of the left atrium. Radiofrequency was applied with elimination of the potentials. Despite ablation in these areas, the patient remained in atrial fibrillation. The coronary sinus was ablated and debulked. Ablation along the right atrial septum to eliminate potentials

was done. Despite extensive ablation in the left atrium, external cardioversion (*at 200 Joules*) restored sinus rhythm.

*(This was a more difficult case. During the ablation, the ideal goal is to spontaneously “terminate” the A-Fib and return the patient to sinus rhythm [or a mild tachycardia]. But, in Travis’ case, despite finding and ablating non-PV potentials in many different parts of the heart and creating blocking ablation lines, they couldn’t terminate the A-Fib and had to electrocardiovert the him back into sinus rhythm. Sometimes in difficult cases, that’s the best that can be done. But the ablation may still be successful because of all the ‘potentials’ that have been ablated/eliminated.)*

Radiofrequency power was titrated if overheating was observed by intracardiac echocardiography and/or elevation of esophageal temperature. *(Most experienced EPs and centers are very careful to avoid overheating and damaging the esophagus which lies behind the left atrium.)*

Isuprel (*isoproterenol*) was infused up to 20 mcg/min for 10 minutes to illicit right or left atrial arrhythmias and to assess pulmonary vein reconnections. *(Isuprel is like adrenaline and is used to try to stimulate the heart to go into A-Fib.)* Following infusion of isuprel, there were sporadic PACs (*Premature Atrial Contractions*) from the left atrial appendage that were not targeted for ablation. *(Because the LAA behaved well during isoproterenol stimulation, Dr. Natale took a wait and see attitude. It’s likely the LAA may never need to be isolated, especially in someone as young and otherwise healthy as Travis is. Full LAA isolation is always possible at a later date.)*

The circular mapping catheter was then placed in the superior vena cava and the superior vena cava was isolated using radiofrequency energy. No phrenic nerve stimulation was present at 20 mA at sites of radiofrequency ablation in the superior vena cava. *(They made sure the ablation didn’t harm or affect the phrenic nerve which is located near the superior vena cava. The phrenic nerve controls the diaphragm and breathing.)*

A total of 58.5 minutes of radiofrequency was delivered. *(This was a very extensive ablation compared to most.)*

At the end of the procedure, Protamine *(which reverses the anticoagulant effect of heparin)* was given, sheaths and catheters were removed and

hemostasis (*stopping bleeding*) was achieved with direct manual pressure. The patient tolerated the procedure well and was transferred in stable condition.

**Plan** (*Post Ablation*)

1. Continue long-term anti-coagulation with apixaban (Eliquis) (*We don't know the reasons why this patient had to continue taking anticoagulants.*)
2. Discontinue antiarrhythmic therapy with flecainide (*Many centers have a patient continue taking antiarrhythmics during the three-month blanking period*)
3. Follow-up in 6-12 weeks
4. Event recorder upon discharge

**Conclusion** (*This repeats the main points of the "Procedure Description" above.*)

1. Successful isolation of all the pulmonary veins. The RIPV was silent at baseline. With ablation of the LSVP, spontaneous atrial fibrillation with rapid ventricular response was documented.
2. Mild atrial scarring was observed.
3. Successful isolation of the posterior wall of the left atrium utilizing roof and infero-posterior lines.
4. Successful ablation of electrograms along the roof, septum and floor of the left atrium.
5. Successful ablation of the coronary sinus to debulk and eliminate potentials.
6. On high-dose isoproterenol (20- mcg/min) there were sporadic PACs from the LAA not targeted for ablation.
7. Successful isolation of the superior vena cava.

**Complication**

None

**Estimated Blood Loss**

<10mls (*"<" means less than; "mls" stands for milliliters*)

**Post Procedure Diagnosis**

Paroxysmal atrial fibrillation s/p PVAI (“s/p” means “status post” or what condition the patient was in after the ablation. “PVAI” stands for the “Pulmonary Vein Antrum Isolation” ablation procedure.)



## ***What Can We Learn from Reading Travis’ O.R. Report?***

It should be noted that most ablations are much simpler than Travis’s case. In paroxysmal (occasional) A-Fib, simply isolating the PVs often makes patients A-Fib free without the need of mapping and isolating non-PV triggers as extensively as Dr. Natale had to do.

The most important part of the O.R. report is the “Procedure Description” which is a blow-by-blow account of what Dr. Natale did in Travis’ heart. After reading this O.R. report, you should come away with an appreciation of the hard work and technical smarts an EP has to have to perform a successful ablation on a difficult case.

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After mapping and ablating potentials in the Pulmonary Veins (PVs), Dr. Natale

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*After mapping and ablating potentials in the Pulmonary Veins (PVs), Dr. Natale found and ablated many non-PV potentials.*

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found and ablated many non-PV potentials in many other parts of Travis’ heart. He made linear ablation lines. He mapped electrograms and ablated them. He found A-Fib signals in the right atrium as well.

But “despite extensive ablation” he still had to electrocardiovert Travis to restore him to sinus rhythm. Happily this worked for Travis who is A-Fib free after his blanking period.

For a full description of Travis’ A-Fib experience (pre and post ablation), see his blog posts, [My A-Fib Journey](#).

## ***Post-Op Update***

Travis writes that at the three-month blanking period after his ablation he hasn’t had even a single A-Fib episode or even a heart palpitation or any issues at all. Because of this, he was taken off of Eliquis.

Read his [6-Month Post Ablation Update](#) on his website, [Living With Atrial Fibrillation](#), ♥

## *A Few Closing Notes*

It should be noted that Dr. Andrea Natale is one of the best EPs in the world. We're very fortunate to be able to study and experience a Master EP's work as described in Travis' O.R. report.

A big **THANK YOU** to both Dr. Andrea Natale and Travis Van Slooten.

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**STEVE S. RYAN, PHD**, is publisher of the non-profit patient education website, *Atrial Fibrillation: Resources for Patients*, [www.A-Fib.com](http://www.A-Fib.com), and author of the award-winning book, *Beat Your A-Fib: the Essential Guide to Finding Your Cure*, and known as *The A-Fib Coach* for his one-to-one mentoring of A-Fib patients ([A-FibCoach.com](http://A-FibCoach.com)).



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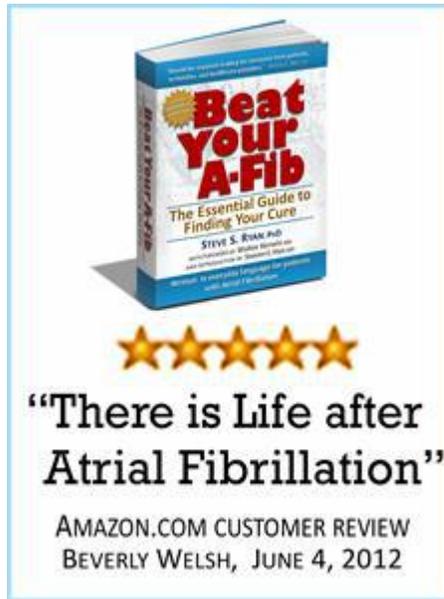
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