

Game Changers: The 20 Most Important Cardiac Anesthesia Articles Ever Published

2017

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Dr. Alan Jay Schwartz: Hello. This is Alan Jay Schwartz, Editor-in-Chief of the American Society of Anesthesiologists' 2017 *Refresher Courses in Anesthesiology*, the latest research and educational findings. The focus of the *Refresher Courses in Anesthesiology*'s CME program and the modules featured is to educate learners on current developments in the science and clinical practice of the specialty of anesthesiology. Returning for a second year, we will be speaking directly with individual authors to learn about their expertise, perspective and insight regarding the featured module.

Today, we are pleased to present the following one-on-one conversation with Dr. Paul Barash, and we'll be highlighting the module titled "Game Changers: The 20 Most Important Cardiac Anesthesia Articles Ever Published."

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Dr. Alan Jay Schwartz: I have the great pleasure of talking today with Dr. Paul Barash, Professor Emeritus of the Department of Anesthesiology at Yale University and a past president of the Society of Cardiovascular Anesthesiologists. Dr. Barash has written a most interesting module for our program entitled "The 20 Most Important Cardiac Papers Ever Published." Paul, please tell our listeners some of the key aspects of your Refresher Course module.

Dr. Paul Barash: Well, actually, it started a few years ago when I was asked by Drs. Gene Hessel and Lance Lichtor to review a book by Webster and Galley on landmark papers in anesthesia. There was delay in getting the book from the publisher, so I decided I wanted to see what it was like to do a similar thing, and I wrote a paper which was then published, on the 20 most important papers ever published in anesthesiology.

From that experience, I felt I wanted to turn to cardiac anesthesia. And the difference between the two is that the timeframe for the 20 best papers in anesthesia covered the discovery of ether anesthesia and its public presentation up until the present, whereas the cardiac anesthesia basically reflected the latter part of the 20th century and into the 21st century. It's interesting to note that there are cardiac papers in the "top 20 papers" article which I mention in this article. So, for example, we have Saklad's physical status article; Hickey's the perception of neonatal pain; Eichhorn's standards of patient monitoring; Engström's work on the modern ventilator; Severinghaus on blood gases; Safar on CPR; and Lowenstein on high-dose narcotic anesthesia.

So, I think where we should start is, to me, the most important paper that's been published in our specialty, Lowenstein's paper from the MGH on high-dose narcotic anesthesia, which was done for people having aortic valve replacement. And what we did is, my co-authors Denise Hersey and Karen Bieterman developed a list of papers, and then we started asking experts around the world what they thought. Universally, Lowenstein's paper came out as the most important paper ever published in cardiac anesthesia. It's interesting to remember it was published in 1969 in the *New England Journal of Medicine*, and it was detailing an excellent set of results on the relatively primitive clinical conditions for people having aortic valve replacement.

The next paper I would choose would be Swan's paper on the use of the pulmonary artery catheter. Although there was a paper published by Forssmann

in 1926 using himself as the research subject, and it was the first human cardiac catheterization, I had issues, and I left it in, in a secondary list, but I didn't know philosophically whether it was appropriate to include any of his work because he had been a physician for the Nazis. His paper on cardiac catheterization was published before the Nazis rose to power.

The next paper I would look at would be the paper by Mark Newman in the *New England Journal*, which detailed neurological outcome following cardiothoracic surgery. And again, it shows a fairly significant incidence of neurocognitive dysfunction at discharge – 53% decline in neurocognitive dysfunction, and at the end of 45 years it improved a little bit to 45% decrease. But it showed there was a high prevalence and persistence of neurologic decline following open-heart surgery.

The next important paper would be Payne's paper, which was the first use of a beta-blocker in clinical practice of anesthesia. It was published in the *British Medical Journal* in 1964. And then a number of papers went on after that. And probably no drug has had the ups and downs that beta-blockers have had over the lifetime of the drug.

Keats and Slogoff's article on perioperative myocardial ischemia leading to postoperative myocardial infarction is very important. It's hard to believe that there was a time where people did not believe that myocardial ischemia had no relation to perioperative myocardial infarction. It was Keats and Slogoff who showed there was a significant relationship. It was done at the Texas Heart Institute, and it was the legendary anesthesiologist #7 who had the highest rate of intraoperative ischemia on the basis of intraoperative tachycardia.

Merel Harmel is given the credit for publishing the first anesthesia paper devoted to the anesthetic technique, and this was for the Blalock-Taussig operation. And it gave a very detailed description of what he did. Usually, the

surgeons alluded to the anesthetic technique in one sentence or two. Harmel talked in detail about the anesthetic protocol.

It's interesting that there was the paper that Christiaan Bernard wrote on the first heart transplant, which was in the *South African Journal of Medicine*, actually may have been better. Because what they did was, they published Bernard's paper and then they published Joseph Ozinsky's paper on the anesthetic management of the first heart transplant; and then in that same issue of the journal, they did Smith and Bosman's commentaries on legal and ethical considerations. So, it's sort of one-stop shopping.

The next paper that I would look at would be actually two papers that were published back to back. One was Slogoff and Keats' paper on which is the best primary anesthetic in coronary bypass surgery; and the second paper published in the same issue of the journal was by Tuman and colleagues at Rush Presbyterian Hospital, and they were looking at, does choice of anesthetic significantly affect outcome during coronary artery surgery? In sum total, both papers showed that choice of anesthetic technique did not affect outcome.

Finally, there was an interesting paper from Warren Zapol. It was on inhaled nitric oxide in persistent pulmonary hypertension of the newborn. The reason why I say this is interesting is, Warren's paper was not the first paper, even though he's considered the leading scientist and proponent of inhaled nitric oxide. Pepke-Zaba in England, and her group, published the first paper and led Warren's group by about a year. But her paper, first of all, is based basically on his experimental work; and secondly, her paper lists a non-recognized indication for the use of nitric oxide, that is respiratory distress, whereas the Zapol group used the vasodilator to improve oxygenation and reduce the need for extracorporeal oxygenation in term and near-term neonates.

Dr. Alan Jay Schwartz: Thanks very much, Dr. Barash. This is certainly an interesting and different Refresher Course module. Our readers are absolutely in for a treat, getting the science and history put together on how cardiac anesthesia has developed into the specialty that it currently is. I certainly encourage our listeners to not only read the entire module by Dr. Barash, but to look at all of the 16 modules in the ASA Refresher Course program this year for articles like Dr. Barash's, all of them highly educational, very interesting, and great continuing education. Thank you.

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Dr. Paul Barash: Thank you.

Dr. Alan Jay Schwartz: Thank you for joining us today and participating in this insightful conversation with this month's featured author. Be sure to join us for next month's one-on-one author interview. To purchase the full subscription of the 2017 *Refresher Courses in Anesthesiology* program, please visit www.asahq.org, click on the Shop ASA link, and search for RCA.

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