Paul Zoll MD: The Pioneer Whose Discoveries Prevent Sudden Death

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ISBN: 978-0-9838131-6-3

This biography of Dr Paul Zoll by Dr Stafford Cohen is a labor of love, but, in some ways, it clouded his objectivity. As we learn from the foreword by Kirk Jeffries, and the prologue by the author, Dr Cohen knew Zoll as a mentor, colleague, and friend. And as we learn from a recently published interview, Cohen took on himself a difficult task, to “honor Zoll, preserve history, to add to his legacy, and to humanize him.” This becomes an overriding theme of the book, as the author strives at the same time to achieve historical accuracy. Why was it necessary to “humanize” and add to Zoll’s legacy?

There is no doubt that Zoll was a giant in the field, but, as we learn from the book, he was regarded as a difficult and controversial person by his contemporaries. From the book, we learn about the life, the work, and the many disputes that Zoll had, and we also learn about his achievements and legacy. Cohen’s ultimate goal is to portray Zoll as the father of modern cardiac electrotherapy. In fact, Zoll’s contributions are described in a way that suggests that, without Zoll, history would have been set back significantly. But the real question is whether the book gives an accurate depiction of the complicated course of discoveries in cardiac pacing and defibrillation, and whether it accurately places Zoll in it, especially given the multiple controversies.

For the most part, readers can find the answer themselves. The disputes are well described, and the outcomes are evident. We will not discuss all of them, but an analysis of Zoll’s major contribution will help provide some objective perspective. Zoll was the first to apply transcutaneous pacing in humans. However, the event is still marred by his dispute with the Canadian group that claimed to be the ones who provided the details of their pacemaker to Zoll, permitting Zoll “to beat” them. But perhaps the most controversial description in the book relates to Zoll’s most important contribution, the application of transthoracic defibrillation in humans. Zoll reported the event in 1956 using alternating current. But, in the 1930s in the USSR, a group led by Dr Naum Gurevich had already established that direct current defibrillation was safer and more effective than defibrillation using alternating current shock. Gurevich’s results were published in the English literature a decade later in 1947. In 1952, the Soviet Ministry of Health issued resuscitation guidelines in which the defibrillator and its application were described in great detail. The defibrillator had paddles and a capacitor size designed for defibrillating human hearts. One such device manufactured in 1952 was brought back to the United States in 1958 by a Western Reserve University physician who had visited the USSR, and had observed the use of direct current transthoracic defibrillation in humans. Cohen is quite dismissive of this. He writes that “the Russian achievement was not publicized, is not well documented, lacks the time-honored necessary data to withstand scientific scrutiny, and apparently did not result in extensive customary practice.” He then concludes “that accolade remains with Paul Zoll.” Cohen’s overwhelming desire to place Zoll ahead of the pack is clear. Although it is likely Zoll never knew about Gurevich’s work, it is now known in the West. However, there is no mention that the group in the USSR worked for decades on the defibrillation problem before and after Zoll’s 1956 report, and that they had made many important contributions, from establishing direct current shock as a preferential way to defibrillate, to introducing the biphasic wave-form many decades before it was used in the Western world. In the meantime, after his important successful transthoracic defibrillation of a patient by using alternating current shock, Zoll vehemently continued to advocate the use of alternating current shock despite overwhelming evidence to the contrary (ie, the superiority of direct current defibrillation). He did the same thing with many of the discoveries that he considered his territory. For instance, he developed transthoracic cardiac pacing, but stubbornly opposed the use of temporary transvenous pacemaker leads, insisting that his method of transcutaneous pacing was all that was needed. He was against VVI pacing, and synchronous atrioventricular (physiological) pacing, as well, insisting that single-chamber (VOO) pacing was sufficient. His reluctance, in fact, refusal, to recognize when the field had passed him by is evident. These are the sorts of things that made Zoll highly controversial, but this was not considered by Cohen. In fact, the book is mostly very forgiving of Zoll when describing the multiple disputes and controversies.

Another area where credit for being first is given to Zoll inappropriately is that Cohen credits Zoll with coinage of the term countershock, although the term was first used by William Kouwenhoven in 1933. In the end, Cohen’s bias favoring Zoll is understandable given his long relationship with Zoll, but is not necessary. Clearly, Zoll was a truly accomplished physician and scientist. He is remembered by his contemporaries as demanding the highest standards from himself and others. His greatness is not defined by being first. Not uncommonly, scientists arrive at the same point independently of each other. What matters is the overall contribution and dedication to the field. Zoll has his place in history as a pioneer working with others on ground-breaking therapies and concepts that have radically changed outcomes for the patients. He is one of the fathers of cardiac electrotherapy. Objective evidence of this is his receipt of the Albert Lasker award in 1972 that he shared with William Kouwenhoven. Ironically, Kouwenhoven spent several decades working in the field of defibrillation, and was beaten by Zoll by 1 year in transthoracically defibrillating a patient. But this precisely illustrates the point: scientists are recognized for their work, continuous effort, and historical legacy, rather than by the date they reported their findings.

Disclosures
None.

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(Circulation. 2015;131:e421. DOI: 10.1161/CIRCULATIONAHA.115.013843.)
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Circulation is available at http://circ.ahajournals.org

DOI: 10.1161/CIRCULATIONAHA.115.013843
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Circulation. 2015;131:e421
doi: 10.1161/CIRCULATIONAHA.115.013843
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/131/17/e421

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