

# This Week's Citation Classic

Weinstein L & Rubin R H. Infective endocarditis—1973. *Progr. Cardiovasc. Dis.* 16:239-74, 1973. [Infectious Disease Serv., New England Medical Ctr. Hosps., and Dept. Med., Tufts Univ. Sch. Med., Boston, MA]

The definition of the basic microbiological, pathoanatomical, pathophysiological, and immunological factors involved in the pathogenesis and clinical behavior of infective endocarditis has led to a better understanding of the disease and restoration of great interest in it. [The SC<sup>2</sup> indicates that this paper has been cited over 165 times since 1973.]

Louis Weinstein  
Department of Medicine  
Infectious Disease Division  
Brigham and Women's Hospital  
Harvard Medical School  
Boston, MA 02115

November 16, 1981

"Infective endocarditis has occupied my attention over almost 40 years during which it has become clear that all the mechanisms involved in the pathogenesis of the disease as well as those operating after infection develops have been defined, it is now possible to understand this disease and to predict with considerable accuracy both its uncomplicated and complicated course as well as to anticipate the need for special therapeutic maneuvers.

"My interest in infective endocarditis was first aroused as an intern in medicine at University Hospital in Boston in 1942-1943. I had the opportunity then to study a large number of patients and to participate in the first trial of treatment with penicillin under the aegis of Chester S. Keefer, the physician-in-chief at the hospital, who controlled the use of penicillin in the US during a study conducted by the National Academy of Sciences. A large number of patients with this infection from all over the country were admitted to the hospital. Treatment consisted of 5,000 units of penicillin given intravenously every three hours for ten days. This dose of the antibiotic proved far too small and was used only because the supply

of the drug was very limited. None of the patients survived.

"The opportunity to study a large number of cases that came to autopsy was a very important experience because of the opportunity to correlate the clinical behavior of the disease with important anatomical changes. I have now studied over 900 cases of this disease, concentrating on correlating its microbiological, immunological, pathoanatomical, and pathophysiological abnormalities with its clinical behavior.

"One of the most important experiences to come out of this study has been the observation that remarkable changes have taken place, without any identifiable causes, in the clinical features of subacute infective endocarditis. The classical and sometimes diagnostic findings are all seen much less frequently now than they were years ago. Most remarkable has been a striking change in the age distribution of the disease, so that the bulk of patients are now in their 50s and 60s. It has become clear that if the diagnostic criteria, short of 'positive' blood cultures, employed years ago were used today, the diagnosis would be over-looked in better than 80-90 percent of cases.

"I believe this paper is a *Citation Classic* for two reasons. It was the first publication that stressed the importance of the multiple factors involved in the pathogenesis and clinical manifestations of the disease. Because of its increasing incidence, especially of complicated cases, an understanding of the mechanisms involved, as detailed in this paper, has stimulated growing interest in infective endocarditis and has led to publication of a large number of papers by me<sup>1-6</sup> and many other investigators.

"Honors received for my studies in infective endocarditis include a medal from the American College of Chest Physicians, and the Bristol and the Finland Awards from the Infectious Diseases Society of America."

1. Lerner P & Weinstein L. Infective endocarditis in the antibiotic era. *N. Engl. J. Med.* 274:199-206; 259-66; 323-31; 388-93, 1966.
2. Weinstein L & Schlesinger J. Treatment of infective endocarditis—1973. *Progr. Cardiovasc. Dis.* 16:275-302, 1973.
3. .... Pathoanatomic, pathophysiological and clinical correlations in endocarditis. I and II. *N. Engl. J. Med.* 291:832-7; 1122-6, 1974.
4. Weinstein L. "Modern" infective endocarditis. *J. Amer. Med. Assn.* 233:260-3, 1975.
5. Cohen P S, Maguire J H & Weinstein L. Infective endocarditis caused by gram-negative bacteria. *Progr. Cardiovasc. Dis.* 22:205-42, 1980.
6. Weinstein L. Infective endocarditis. (Braunwald E, ed.) *Heart disease. A textbook of cardiovascular medicine.* Philadelphia: Saunders, 1980. p. 1166-220.