

Leaders in Cardiovascular Medicine

Eugene Braunwald MD: an icon of the 20th century still going strong

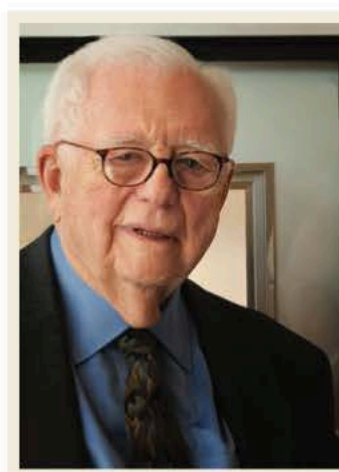
In a new series profiling the world's leading and most influential cardiologists, Mark Nicholls reports

Considered one of the pre-eminent cardiologists of our time, Dr Eugene Braunwald, MD, has extended knowledge of congestive heart failure, coronary artery disease, and valvular heart disease. Having published hundreds of papers and medical articles, with his textbook *Braunwald's Heart Disease* cited worldwide, Dr Braunwald has received numerous honours and awards.

Born in Austria in 1929, his family emigrated to the USA during World War II and after his studies he began a long, successful and hugely-influential career as a cardiologist. Now well into his 80s, he still practices medicine and continues to contribute to the field of cardiology.

Where did you grow up and what is your background?

I was born in Vienna, Austria in 1929. My family and I fled Austria shortly after the country was annexed by Nazi Germany in 1938 and we lived in England for almost a year and a half and then emigrated to New York, where I attended public schools, New York University, and from 1948 to 1952, its School of Medicine. My first wife, Nina Starr Braunwald, was a classmate and became the first female cardiac surgeon. She died in 1992, and I am remarried to Elaine Smith, a former Chief Operating Officer at the Brigham and Women's Hospital in Boston. We have three daughters who live in the Boston area and seven grandchildren.



Eugene Braunwald MD

How did your interest in cardiology and science develop?

I became interested in cardiology as a medical student, when I spent 3 months in one of the first cardiac catheterization laboratories in the USA at New York's Bellevue Hospital. I assisted in research on the

pathophysiology of heart failure, an area in which I retain an interest and in which I continue to work.

Where did you undergo your medical training and what is your current position and role?

I served an internship and a fellowship in cardiology at New York's Mount Sinai Hospital, where I conducted research on valvular heart disease and participated in the first measurements of the pressure gradient across stenotic mitral valves.¹

I served a second cardiology fellowship at Columbia University in the laboratory of Nobel Prize winner Andre Cournand. In 1955, I moved to the intramural program of what is now the National Heart, Lung and Blood Institute (NHLBI) in Bethesda, Maryland, where I took my third fellowship in basic cardiovascular physiology. After completing my medical residency at Johns Hopkins, I returned to the NHLBI where I became Chief of Cardiology and then Clinical Director of the Institute. I left Bethesda in 1968 to serve as Chair of Medicine at the University of California, San Diego. In 1972, I moved to Boston and Harvard Medical School as Chair of Medicine at the Brigham and Women's Hospital. In 1984, I established the TIMI Study Group, an

academic research organization, where I continue to work full time, and hold a chair at the University. For the past 8 years I have also chaired the Heart Failure Clinical Trials Network of the NHLBI.

Who are the people who have influenced you most and why?

The late Andrew Morrow, who was Chief of Cardiac Surgery at the NHLBI, was first my mentor and then my colleague. Our very close relationship for over a decade gave me unique insights into cardiology, as they are seen by a surgeon, which have been extremely helpful to me.

He was a close research collaborator and we did some exciting things together in the early descriptions of clinical and pathophysiological characterization of hypertrophic cardiomyopathy.² We developed techniques of left heart catheterization, and used them to characterize the pathophysiology of valvular abnormalities. Morrow taught me the importance of studying the natural history of cardiovascular disease, which amazingly was not considered to be very important in the 1960s. He even taught me to write clearly, which has been especially useful to my subsequent efforts as an author and editor.

What are the key areas of research for you?

During my NHLBI years, our group described the first neurohormonal abnormalities in heart failure^{3,4} and for the development of the method for assessing ventricular function by measuring left ventricular ejection fraction⁵ and dp/dt.⁶ During my years in California, we came up with the idea of trying to limit the size of myocardial infarction. I am most proud of our study of experimental myocardial infarction, in which we made what was at the time a heretical statement: 'In patients with myocardial ischemic injury resulting from coronary occlusion, measures designed for reduction of myocardial oxygen demands and improvement of coronary perfusion when effected promptly after a patient has been brought to a hospital, might reduce the ultimate size of the infarct.'⁷ This was well before techniques of reperfusion had been developed.

How has your research evolved over the years?

When I moved to Boston, I wanted to apply the idea described above to patients. We were among the first to utilize intracoronary fibrinolytic therapy in acute infarction and were able to demonstrate that reperfusion indeed salvaged ischemic myocardium in patients with coronary thrombosis.⁸ This led to the first Thrombolysis in Myocardial Infarction (TIMI) trial, which was supported by the NHLBI, which, in turn, led to the establishment in 1984 of the TIMI Study Group, which is now conducting its sixtieth trial. We have branched out to studying antiplatelet agents, novel anticoagulants, lipid modifying agents, and anti-diabetic drugs. We work with investigators in more than 1000 hospitals in 46 countries. Dr Marc Sabatine is now chair of the TIMI Study Group.

What piece of work are you most proud of?

During this period of my professional life, I am proudest of the SAVE trial with Marc Pfeffer *et al.*, which demonstrated the benefits of ACE inhibition after acute myocardial infarction,⁹ as well as of the TIMI 22 trial with Chris Cannon in which we showed the clinical benefits of intensive compared with standard LDL-cholesterol reduction in patients following an acute coronary event.¹⁰ Both of the latter

trials altered guidelines and practice. It has been my good fortune to have been in the right place, at the right time, and most importantly, with the right people.

What do you do outside of your profession, your interests away from medicine?

My non-medical interest, really passion, since childhood, has been in classical music. I 'inherited' this from my parents, who were exposed to it in Vienna, the classical music capital of the world in the first third of the 20th century. I am an avid listener to chamber music and opera, but sadly unable to play any instrument (not for lack of trying).

Which book would you take away with you to a remote island?

I would take the *Last Lion*, a three volume mega biography of Winston Churchill by William Manchester. As a child I became inspired by Churchill's speeches, which were rebroadcasted in the USA. His biography shows how a single person, despite some weaknesses, could change the history of the world. On a more personal level, it provides me with a deeper understanding of the Europe into which I was born and the extraordinary events leading up to, during and after the World War II. I lived through those turbulent times but was too young or too busy with my studies to comprehend their significance.

What advice would you give to young researchers as they set out on a path towards success within the field?

Young people who are contemplating a career in cardiovascular research should understand that we are now entering the most exciting period in the proud history of cardiovascular science and clinical cardiology. Advances in molecular biology, genomics, the ability to genotype populations, to be able to collect and interpret 'big data', the advances in bioengineering and nanotechnology, the development of wearable and implanted devices to accurately monitor and treat ambulatory patients will transform cardiology. It will take intensive training and a powerful commitment to develop the skills required to move the field forward. However, the personal gratification that can come from making an impact on or contributing to preventing and/or treating cardiovascular disease—still the most common cause of death or disability in the world—will be enormous.

References

References are available as supplementary material at *European Heart Journal* online.