

EDITORIAL

The world of cardiology, the cardiology of the world

Eugene Braunwald - the father of modern American cardiology

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At his birth, on August 15, 1929, in Vienna Austria, they gave him the name Eugene, which stands for “the one well born” (from the Greek word *eugenios*). Unusual name choice for the Jewish tradition, which most frequently gives biblical names to their children.

Wilhelm and Clara Braunwald were inspired to take their two sons and live the country after the *Anschluss*, in 1938. What followed in Austria for the Jewish people was tragic: marginalization, deportations and internment in the horrific German “concentration camps”.

As the eight years old Eugene left his native country, he took with him the strong impressions of that moment:

We left Vienna in 1938 under very difficult circumstances. What was disappointing was not so much that the Nazis took over, but that they were received with open arms by the Austrian population. That was a shock. I was eight and a half that time and I remember that my parents' phone never rang again. My father was a fifth generation Viennese and had gone to school there and had many friends. It was a sudden cut-off.

After a short stay in England, Braunwald family arrived in New York City, where Eugene went to a public school, then graduated college and medical school at New York University (NYU). Fascinated by heart function, the young medical student was involved in cardiac physiology research in the cardiac cath lab led by Ludwig Eichna. At the time, NYU heart catheterization laboratory was one of the only 12 existing in the United States. Also, during his internship at Bellevue Hospital, Eugene did have a chance to meet André Cournand, the famous French physician and scientist, who won the Nobel Prize for medicine and biology in 1956, for developing heart catheterization technique.

Next, in 1955, the young Dr. Braunwald became the chief of cardiology at the newly inaugurated National Institute of Health, in Bethesda, Maryland. There, he was involved in clinical care and research and directed his team to investigate the mechanisms of the congestive heart failure and of the hypertrophic cardiomyopathy. They also developed the technique of transeptal left heart catheterization, and completed major studies in the field of valvular heart disease. Dr. Braunwald's team was the first to report the reversibility of the pulmonary hypertension when the mitral valvular abnormality was repaired.

Dr. Braunwald and his young colleagues were the first to determine the left ventricular ejection fraction and introduced the concept of LV dp/dt.

Concerning the pathophysiology of the heart failure, Braunwald's group first described the neurohormonal abnormalities associated with the syndrome.

The team also contributed with major research in myocardial oxygen consumption, and connected the duration of oxygen deprivation with the extent of the

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muscle destruction in acute MI's. He coined the phrase *time is muscle* and postulated the early intervention in treating the acute coronary events, shaking off the passive attitude of the old tradition cardiology professionals.

Robert M. Califf said about Eugene Braunwald that he is *someone who has mentored more people than any other person in the history of cardiology*. Early in his career, and for the entire duration of it, Braunwald demonstrated a keen interest in selecting gifted young physicians, in guiding their first steps in research and in helping them constantly to achieve results.

In 1968, Braunwald moved to University of California at San Diego, where he dedicated himself to start a new cardiology research team, as he made great efforts for setting the best internal medicine teaching system in a new and growing medical school, in which he became the first internal medicine chairman.

From California, Dr. Braunwald returned to the East Coast, taking a professor position at Harvard Medical School in Boston in 1972. There, he was involved to revolutionize the department, to remove the old people, and to populate the cardiology section with young, talented and ambitious physicians. He trained two generations of academics, who became very influential in academic medicine in various cities.

At Brigham and Women's Hospital, Dr. Braunwald's research allowed major progress in the field of coronary artery disease. He is the author of the *open artery concept*, which became fundamental for the treatment of acute myocardial infarction, he clarified the issue of unstable angina, postulated and demonstrated the role of lipid reduction in patients with CAD, and initiated the first major clinical trial TIMI (Thrombolytics in Myocardial Infarction), which played a significant role in the progress of evidence based medicine philosophy.

Dr. Braunwald's team (1971) shares with Dr. E.J. Chazov's group (1975) the merit of demonstrating reduction in infarct size by streptokinase intracoronary injection.

Under Dr. Braunwald guidance, the very successful TIMI was started by NIH in 1984 and recruited 26.000 subjects, from 50 countries, monitored in more than 5.000 cardiology centers. The trial, which reached the TIMI-6I phase, addressed to acute myocardial infarction therapy, many interventional procedures, pharma-

codynamics of multiple cardiovascular drugs, the role of ACE inhibitors in cardiac disorders, MI biomarkers, genotypes and genomics, CAD prevention, and many others.

The living Nobel Prize winners in medicine voted Eugene Braunwald, called EB by friends and admirers, as *the person who has contributed the most to cardiology in recent years*, and his former student Thomas H. Lee published in 2013 the book *Eugene Braunwald and the Rise of Modern Medicine* (Harvard University Press). Lee called Dr. Braunwald *the most influential American cardiologist since Paul Dudley White (1886-1973)*.

Braunwald's publishing activity is astounding: one of the most prolific author contributed 1.200 papers, with 136.000 citations (*h index 177*), his legacy book *Braunwald's Heart Disease. A textbook of Cardiovascular Medicine (Elsevier 10th edition)*, as well as the cardiology chapter in *Harrison's Principles of Internal Medicine (McGraw Hill 17th edition)* plus Eugene Braunwald: *Essential Atlas of Heart Disease (Current Medicine Group 2005)*, Eugene Braunwald: *Late breaking clinical trials (Elsevier 2016)*, Eugene Braunwald, Lee Goldman and Christopher Menz: *Primary Cardiology (Saunders 1998)* and numerous others.

PubMed stated that *EB had more publications in the top general medical and cardiology journals than any of the more than 42.000 authors analyzed*.

Recently the famous cardiologist stated few advises for the young scientists:

Young people who are contemplating a career in cardiovascular research should understand that we are now entering the most exciting period...It will take intensive training and 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.

Had Eugene Braunwald not immigrated from Austria, if he survived, he may have become a successful medical scientist in the illustrious series of Austrian medicine: Ignaz Semmelweis, Carlum Rokitansky, Moritz Kaposi, Theodor Billroth, Frantisek Chwostek, Sigmund Freud, Ernst Wertheim, Hans Asperger...

But then, Dr. Braunwald's contribution would have not give birth to a well *born modern american cardiology*, which owes so much to the well *born Eugene*.