“What if?...” is an often-asked question in politics, in the history of wars, and in the humanities. The same question is seldom asked in the sciences and is practically never encountered in medicine. This overview of the significant contributions of 12 pioneers in medicine whose life was cut short—all died by age 35—is an attempt to fill the void.

**Reinier De Graaf** (1641-1673), Dutch physician-anatomist, lived in Delft, a small city where his colleague and neighbor, Antoni Leeuwenhoek (1632-1723), carried out his microscopic observations. De Graaf was Catholic and he practiced in Delft because the Protestant University of Leiden denied his application for a staff position. In 1672, De Graaf’s remarkable discoveries of the ovarian follicules and corpus luteum made him instantly famous. Soon thereafter, De Graaf died at age 32 due to a virulent infection.

**Jo L. Loeske** (1724-1757), was a physician and surgeon in Berlin. He is best known for his primary interest in the function and diseases of the joints. It is less well known that he wrote and lectured on alterations of blood vessels due to aneurismal dilatation and narrowing. At his death, he was only 33 years old.

**William Hewson** (1739-1774), English surgeon-anatomist, gave the first complete account of the lymphatics in his book published in 1771. He described leucocytes as derived from the lymphatic glands and the thymus. Hewson studied cells and fibers obtained by his inventions, thoracentesis and paracentesis. He died at age 35 of a dissection wound on his hand.

**Xavier M. F. Bichat** (1771-1802), French army surgeon turned pathologist, was a diligent dissector and writer. By age 30 he had written and published 3 separate books in 7 volumes. Despite the fact that Bichat did not use a microscope, he introduced the term “cellular tissue.” By this term he meant the subcutaneous fat and tissues surrounding the capsule of various organs. In his book on membranes, there are detailed descriptions of fibers, vessels, and nerves infiltrating cellular tissues with extension into the depth of organs. Bichat was able to recognize, with the naked eye, 21 different tissues. He died at age 31 due to consumption and an injury received through a fall.

**John S. Dorsey** (1783-1818), American surgeon, was an accomplished vascular surgeon. In 1813, at the age of 30, he published the first systematic treatise on surgery in the United States. In his two-volume text, Dorsey introduced scores of new surgical techniques and advocated the correlation of operative and pathologic findings. He was only 35 when he died.

**Charles M. Billard** (1800-1832), French pediatrician-pathologist, performed hundreds of...
autopsies on infants and children. In his textbook on pediatric diseases, published in 1828, he correlated clinical data with postmortem findings and produced the first comprehensive clinical and pathologic classification of pediatric diseases, with attention to preventive measures. He died at age 32.

Horace Wells (1815-1848), Connecticut dentist, introduced nitrous oxide anesthesia in 1844 to deaden the pain of having teeth pulled. He did this by asking a friend to extract his aching tooth under the influence of the gas. However, his method suffered a setback because at a public demonstration in 1845 at the Massachusetts General Hospital in Boston, he removed the gas-bag too soon. The patient began to scream and the students laughed. Wells never recovered from the fiasco; he discontinued his work, and committed suicide at age 33.

Richard J. Mackenzie (1821-1854), pioneer Edinburgh surgeon, in 1849 introduced partial amputation of the extremities for easy prosthetic fitting. He volunteered for military service to perfect his operative techniques and died in the Crimean War near Sebastopol at age 33.

Henry Gray (1827-1861), London physician-surgeon and anatomist, published the first edition of his Anatomy in 1858. At age 34 he died of smallpox, which he contracted from a nephew. Gray’s Anatomy remains a standard textbook to this day. The 40th edition was printed in 2008.

Otto F. C. Deiter (1834-1863) German physician, discovered glial cells at age 28, the year before he died. He demonstrated that each nerve cell possesses an axis-cylinder or nerve process. His discovery of cells on the membrane of the cochlea, the median root of the auditory nerve, and the vestibulospinal nerve tract served as ground to a new field in medicine, audiology.

Carlo L. Rovida (1844-1877), an Italian physician, was interested in the chemical composition of dusts, urinary casts, and stones of the urinary tract. He studied these materials by microchemical and histologic techniques. He proved the presence of silica in the lung and introduced the term silicosis. Comparing colorless and yellow urinary casts, Rovida demonstrated differences in their protein composition and traced histologically the origin of the yellow casts to the renal tubular cells. He died at age 33.

Joseph Paneth (1857-1890), Austrian physician-histologist, made a famous discovery in 1888. By microscopic examination of the crypts of Lieberkuhn in the small intestine, he identified the cells that are known eponymically as Paneth’s cells. He made this discovery two years before his death at age 33.

As a concluding remark, it is a realistic possibility that if these pioneer medical scientists had not died so young, they might have gone on to make discoveries concerning human cells, thymocytes, neuroendocrine cells, atherosclerosis, hearing aids, and general anesthesia by intubation. Such scientific contributions and medical advances might have been accomplished many decades earlier than they eventually were achieved.