BEHIND THE NAME

George R. Minot helped cure pernicious anemia

Minot’s research helped conquer a fatal disease that afflicted thousands worldwide.

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In 1926, George Richards Minot unwittingly set the stage for millions of dinnertime fights between mothers and children.

In that year, Minot and his partner William P. Murphy proved conclusively that liver is, in fact, good for you. The discovery that liver could cure pernicious anemia, which at the time killed thousands annually, led to a 1934 Nobel Prize in Physiology or Medicine for the pair. They shared the award with George Hoyt Whipple, the physician whose early experiments with animals first showed that liver could counteract the effects of anemia.

Family of Physicians

Born in 1885 to leading Boston physician James Jackson Minot and his wife Elizabeth Whitney, Minot was born into one of the oldest families in the country and one of the most prominent families in New England.

James Jackson Minot was a private practitioner and staff member at Massachusetts General Hospital — the hospital co-founded in 1821 by his grandfather, James Jackson. Jackson also was the second Hersey Professor of the Theory and Practice of Physic at Harvard.

Minot’s great uncle, Francis Minot, was the third Hersey Professor. His cousin, Charles Sedgwick Minot, was a leading anatomist and a Harvard professor.

Despite coming from a medical family, Minot was apparently less than confident about his ability to handle the busy life of a doctor. But he dutifully entered Harvard Medical School and earned his MD in 1912.

During his time as a medical student and later during his internship at Massachusetts General Hospital, Minot developed a serious interest in blood disorders and pernicious anemia.

He began keeping precise records of the eating habits of his patients with anemia. An entry in the Biographical Memoirs of the National Academy of Sciences suggests that it was Minot's familial interest in nutrition that caused him to focus so intently on his patients' diets.

A young doctor on the rise

Minot completed his internship at Johns Hopkins University from 1913 to 1915 under the tutelage of William Sydney Thayer and William Henry Howell. It was then that Minot and George Denny, MD, another young Bostonian, published a paper establishing that circulatory stasis during perfusion of a dog's liver produced an increase in the antithrombin content of the blood in the hepatic vein. Their research played a crucial role in Howell's development of heparin three years later.

In 1915, Minot returned to his native Boston to take appointments at Harvard and Massachusetts General. Later that year he would marry Marian Linzee Weld. The couple had two daughters, Marian and Elizabeth, and a son, Charles.

Minot's health took a serious turn for the worse in October 1921 when he was diagnosed with diabetes. He struggled to make it to the hospital throughout a year of illness, dietary restrictions and weight loss until the availability of insulin in 1923 saved his life.

From then on, Minot weighed and measured all this food at home and when dining out, demanded advance knowledge of the menu so he could estimate calories and carbohydrates before ordering.

Shortly before his diagnosis, Minot accepted the invitation of Edwin A. Locke, MD, and joined a small group of physicians in private practice. One of the doctors who eventually joined the group was William P. Murphy.

Meanwhile, 3,000 miles away…

The story behind the defeat of anemia began in 1918, 3,000 miles away at San Francisco's Hooper Foundation. There, George Hoyt Whipple was exploring how different foods affected hemoglobin production in animals.

Five years later, as a professor of pathology and dean of the University of Rochester School of Medicine and Dentistry in New York, Whipple and Frieda Robscheit-Robbins, MD, showed that an animal's bone marrow increased hemoglobin production in response to chronic anemia, but only in the presence of such foods as liver and spinach.

In 1922, building on Whipple's experiments, Minot began trying to improve the eating habits of his private patients with pernicious anemia with Murphy's help. He ordered a diet "rich in iron and purine derivatives, containing 100 grams to 240 grams of liver, 120 grams of muscle meat, leafy vegetables, especially lettuce and spinach, fruit and egg and milk."

It took three years, but Minot eventually got some of his patients to eat the "optimal" amount of lightly cooked liver — more than a half pound each day.

Patients on Minot's diet recovered rapidly, with many showing improvement after only a few days. Later examination of patients' blood showed newly formed reticulocytes, demonstrating the diet's efficacy.

Minot and Murphy presented the results of their liver cure to the Association of American Physicians in May 1926, although it appears those in attendance did not immediately appreciate the import of the moment.

A year later, Minot began working with Harvard chemist Edwin J. Cohn, PhD, to isolate the active ingredient in liver. The pair identified "water-soluble vitamin B," but it was not until 1948 that researchers in the United States and Great Britain pinpointed vitamin B12 as the crucial compound. That discovery meant that what had been a fatal disease could be treated with monthly injections of 30 mcg to 100 mcg of cyanocobalamin.

Teacher, researcher and leader

The liver treatment would lead to Minot's greatest professional success when he, along with Murphy and Whipple, won the Nobel Prize — but he stayed busy in the interim.

Minot became member of the Board of Consultation at Massachusetts General in 1927. A year later, he succeeded his friend and mentor Francis W. Peabody as director of the Thorndike Memorial Laboratory at Boston City Hospital, became chief of the hospital's Fourth Harvard Medical Service and was named a senior professor at Harvard.

Minot would take over the Second Medical Service in 1930, but he would turn over both clinics to his colleague, Soma Weiss, MD, two years later.

Although he is best known for the development of liver therapy and his research into anemia and other blood disorders, Minot's greatest influence may have come during his 20-year stint as director of the Thorndike. More than 400 young physicians served

there under his tutelage.

Minot built a reputation for his willingness to encourage and consult younger physicians at Thorndike. He would mold the institution into one of the nation's premier research facilities before retiring in 1948 as his health deteriorated.

Minot began suffering from complications related to diabetes in the early 1940s. A stroke in 1947 left his left side paralyzed and confined him to a wheelchair until his death in 1950. – *by Jason Harris*

For more information:

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