William Stewart Halsted (1852–1922): father of American surgery

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William Halsted is not remembered as an affectionate man. He was neither a beloved teacher nor a particularly compassionate surgeon. But his accomplishments were many, and his revolutionary surgical education and techniques vastly improved patient outcomes. To many in American academia, he is the unquestioned father of modern day surgery.

FIRST GIFT Any nurse, operating room technician, medical student or physician would appreciate an early example of a Halsted contribution, the latex glove. The story of its genesis is perhaps the only glimpse of sentimentality in this man’s life. Halsted had been working with Caroline Hampton, an able first assistant in the operating theatre at Johns Hopkins University Hospital when he noticed that her hands were chaffed and raw from the strong disinfectant mercuric chloride. Accordingly, he approached the Goodyear Rubber Company for custom-made protective gloves. It was an intervention conceived in romance and ending in marriage. Surgical gloves, meanwhile, became an effective and trendy ritual in the operating room. He himself succumbed, and battled this demon for the rest of his life.

FRAMEWORK Having been born to a well-heeled family, Halsted received a privileged education, first supervised by a governess until age ten, then attending Andover and Yale. His initial interest was in sports, and it was not until his senior year at Yale that he decided to become a physician. Perhaps it had something to do with his college dormitory being located next door to a medical clinic. He attended the New York College of Physicians and Surgeons, and upon graduation in 1876, travelled to Europe to further expand his medical education. As was then the tradition, Germany was the favoured destination. During his travels, Halsted met many European pioneers, among whom were Rudolf Virchow and Theodor Billroth. He befriended Billroth’s assistant Anton Wülfler in Vienna, and mastered human anatomy and pathology, which served him well in his future surgical innovations. His German exposure heavily influenced the overhaul of medical education at John Hopkins, whose curriculum was promptly embraced as the gold standard for residency programmes throughout America.

In 1880, Halsted returned to New York and established a reputation as a skilled surgeon, a daring experimenter and a productive researcher, performing some of the earlier experiments on blood transfusions. Alas, within a few years, he fell prey to cocaine addiction. Just as Freud had so catastrophically experimented with cocaine to determine its effect on the central nervous system, Halsted was attracted by the prospect of its anaesthetic potential. After Karl Koller showed that a few drops of cocaine could anaesthetise the surface of the eye, Halsted began to experiment with its effect on the buccal mucosa. In 1884, he persuaded some of his students to undertake the experiment with him and most promptly became addicted.

LEGACY AT JOHNS HOPKINS Halsted’s greatest triumphs came after he was recruited to Johns Hopkins in 1888 by his friend and guardian William Welch, Professor of Pathology. Originator of the Halsted School of Surgery, Halsted modelled it after the German system, filling it with many assistants, a few residents and one chief resident who held the position for two years. The chief resident was taught by Halsted himself, and was in turn responsible for teaching those below him. It has been estimated that a dozen of Halsted’s chief residents went on to become professors of surgery in medical schools such as Yale and Stanford. Harvey Cushing, the father of neurosurgery, was probably his most notable trainee.
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Johns Hopkins, boasting "the contagious companionship of

education," became the Mecca of American medicine.

Its winning formula: insistence on an affiliated university

teaching hospital, postgraduate qualifications for entering

medical students, a rightful place for women applicants,

and uncompromising quality centreing on the triad of

patient care, teaching and research.

HALSTEDIAN APPROACH Halsted took pride in his
careful and meticulous surgical techniques. One of the most
lasting fruits of the countless evenings that he spent in the
anatomy lab was his respect for human tissue. It taught him
that gentle handling of lacerated tissues would aid healing
by causing less damage to the blood and nerve supply in the
operative field. In an age of catgut suture, he proposed
instead, the use of fine silk to better approximate the intricate
histology of the human body. Halsted emphasised respect for
suture placement, and his mantra of "don't suture the tissue
with suture" continues to echo in countless operating theatres
today. He also hypothesised that infections following surgery
may be reduced if the superficial layers were closed one by one at
a time, the aim being to reduce the dead space that could serve
as a nidus of infection. His careful attention to detail in this
manner greatly reduced incidences of site infections, suture
breakdown, skin breakdown and postoperative abdominal
abscess formation. The sum of these recommendations
came to be known as the Halstedian approach to surgery.

NOVEL PROCEDURES In 1889, Halsted described
the first radical mastectomy. Breast cancer, at the turn of
the twentieth century, was a devastating disease with no
documented successful treatment, surgical or otherwise. In
addition, it was uncommon to operate for palliation, and as a
result, most women suffered greatly with their cancerous
growth spreading and invading the chest wall. Halsted devised
the en bloc method of removing the breast, lymph nodes and muscles of the chest wall. This had the immediate
impact of removing the necrotic foul-smelling tumour, even
if cure was not always possible. Although Halsted's radical
methodology was no longer in vogue today, it offered real hope
for victims of breast cancer at the time. At the American
Surgical Association meeting in 1889, Halsted described his
series of 133 patients, 76 of whom had survived for three
years, and 52% were disease free. Halsted also gets the credit
for the working definition of a successful cancer treatment as
one which maintained the patient in a disease-free state for a
period of five years.

In 1890, Halsted published "The Radical Cure of
Inguinal Hernia in the Male," which evolved into the Halsted
procedure. Many careful dissections had convinced him
of the complex but orderly nature of the abdominal wall,
and this knowledge enabled him to tackle hernia repair,
lithotomy without satisfactory surgical treatment. In 1907,
Halsted described the first successful surgical treatment of
hyperparathyroidism. He also contributed greatly to thyroid
surgery, doubtlessly being influenced by his European friend,
Theodor Kocher, the Nobel-prize winning Swiss thyroid
surgeon. Coupled with many years of research on the anatomy
and physiology of the thyroid gland in dogs, Halsted authored
"The Operative Story of Goitre, the Author's Operation" in
1920. In it, he chronicled his experiences with 650 operations
for hyperthyroidism.

ADDITION For all his brilliance, Halsted was a hapless
drug addict, first to cocaine and later, to morphine. Through
the haze of drug intoxication, he continued to operate, at one
time serving as an attending surgeon at five different area
hospitals as well as being Chief of Surgery at Hopkins. By
all accounts, he remained fully functional. Yet, addiction did
render him a social recluse, who would steal away to brief
meetings or extended summer sojourns in Europe, presumably
feed his drug habit. While Halsted was a vibrant and
enthusiastic teacher and practitioner in his earlier days in New
York, he was now an uninterested chief, aloof and despondent.
He made several attempts at drug rehabilitation, including
hospital stints at Butler Hospital, a private psychiatric facility,
but was unable to completely kick the habit.

Throughout his life, Halsted was plagued by multiple
minor illnesses, and a serious bout of bronchitis in 1919 caused
him to be house-bound for two months. Before he could fully
recover, he developed abdominal symptoms indicative of
gallstone disease. Surgery was followed by a prolonged and
incomplete recovery, with recurrent bouts of colic. In 1922,
Halsted developed fever, abdominal pain and jaundice. Two
of his former surgical trainees were summoned to Baltimore
to operate on the professor. They removed a large obstructing
stone, but his postoperative course was complicated by
gastrointestinal bleeding and pneumonia. William Halsted
died on September 7, 1922, his remains buried in New York,
where his illustrious surgical career began.

BIBLIOGRAPHY

- Hannan SA. The magnificent seven: a history of modern thyroid surgery.
- Jarczok S. William Halsted on reduction of blood in carbon monoxide
- MacCallum WG. William Stewart Halsted - Surgeon. Baltimore: The
  Johns Hopkins Press, 1930.
- Sakorafas GH. The origins of radical mastectomy. AORN J. 2008;
  88:693-8.
  1956.