

## THE MAN BEHIND THE PRINCIPLES

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**Categories :** [Vets](#)

**Date :** August 26, 2013

**JACK REECE** looks at the career of a 19th century American surgeon who championed early anaesthesia and pioneered aseptic surgical procedures

**EVERY veterinary surgeon who operates will know Halsted's principles of surgery and every vet who teaches surgery will regularly recite the principles to students learning surgical skills. But who was Halsted and where do his principles come from?**

Disappointingly, it turns out William Stewart Halsted (1852-1922) was neither British nor a veterinary surgeon, but a 19th century American surgeon working in New York and Baltimore. Despite these handicaps, modern veterinary surgery owes a great deal to this complex, driven medic.

It was Halsted who undertook much of the early work on cocaine as an anaesthetic agent – in the process becoming addicted to such an extent he was incarcerated in a sanatorium twice in his early career.

Although some sources suggest Halsted remained manageably addicted throughout his life, he recovered sufficiently to continue professional duties. Some of his coworkers died as a result of their self-experimentation with the anaesthetic properties of cocaine.

Despite these grave consequences, rendering the surgical site painless was an important step in improving surgical practice. Prior to this, surgeons were forced to be quick and necessarily rough to shorten the period of intraoperative pain for their patients. Halsted was able to advocate “safe” surgery rather than quick surgery because he could take his time and be meticulous.

After recovery from his cocaine addiction he was, perhaps unsurprisingly, obliged to move to Baltimore where the famous John Hopkins Hospital had just been founded, and where in 1892 he became professor of surgery – having satisfied the hospital authorities he was cured or had conquered his earlier addiction.

The developments Halsted introduced reach into many branches of surgery, including strict asepsis, the use of orthopaedic plates and screws in fracture repair, radical mastectomy for treating breast cancer, repairs of inguinal hernias and vascular aneurisms.

At the beginning of his career, Halsted had insisted on operating in a specially designed theatre that was as sterile as possible.

## **Allergy necessity**

Halsted is often credited with introducing surgical latex gloves as an improvement in aseptic surgical technique. However, it seems likely this is not correct. He married his theatre nurse in 1890 and she was allergic to the mercury chloride that was, at the time, used to improve sterility. Halsted had latex gloves made to alleviate his wife's allergy rather than improve sterility. The use of these gloves specifically to improve surgical sterility was left to one of Halsted's students, the splendidly and appropriately named Joseph Bloodgood. Surgical gowns and caps followed to replace frock coats in the operating theatre.

Throughout his education at Yale University and Columbia Medical School, where he rowed and was captain of football, and his early professional life in New York, Halsted was popular and outgoing, and reported to be an inspiring and charismatic teacher. Recognising deficiencies in his own medical education, he travelled to Germany where he learned more science and anatomy than was possible in the US at that time, and experienced the methods of German surgical education that were to have profound effects on his work on his return to America.

After his move to Baltimore, Halsted's manner changed and he became reserved, shy and abrupt – probably as he wrestled with the after-effects of his cocaine addiction. It has been suggested this cocaine-related change in personality was responsible for the numerous surgical advances Halsted pioneered at John Hopkins. The inspiring teacher of New York was replaced by the abrupt and dull professor in Baltimore. Halsted was an exceptional teacher of gifted students, but impatient with others. He apparently operated in silence and grew intolerant of noise, distractions and disorder in his theatre.

Encouraged by what he had seen in Germany, Halsted was an enthusiastic supporter of the development of an organised system of surgical education that encouraged increasing responsibility as the student progressed. This system has become adopted throughout the medical world and increasingly in the rarified world of referral veterinary practice. Internships under Halsted lasted a gruelling seven or eight years and were an “unparalleled learning experience”.

## Internships

Perhaps the most important feature of Halsted's internship programme at John Hopkins was encouraging original scientific investigations in the surgical internship, thus developing the clinician-scientist, which promoted advances in surgery and the dissemination of these advances to the profession.

Previously, surgeons tended to view colleagues as competition and guarded advances in technique carefully. Then, as now, such programmes of advanced training moved able students through a hierarchy of medical positions – from intern, assistant, resident to house surgeon, increasing responsibility all the time, and then, as now rounds were described as dull. Among those medics trained under Halsted was Cushing of adrenal disease fame.

With the greater anatomical knowledge acquired in Germany, his advocacy of “safe” surgery and his interest in clinician-scientists, Halsted was well placed to improve intestinal surgery. Using dogs, he demonstrated that intestinal sutures should be placed through the submucosa to improve healing. He also introduced fine surgical silk as a suture material in place of catgut.

Halsted developed and advocated radical mastectomy for breast cancer, becoming more radical and invasive in his surgical approach in an attempt to cure the disease.

As to the surgical principles that carry his name and are adopted by all surgeons today, it appears Halsted never drew these all together into one paper or surgical text. Instead, they represent a distillation of the scholarly, methodical approach Halsted had to surgery and that was drilled into his surgical interns at John Hopkins Hospital.

## References

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## HALSTED'S PRINCIPLES

Gentle tissue handling;

Control of haemorrhage;

Preservation of blood supply;

Strict asepsis;

Minimise tissue tension;

Accurate tissue apposition;

Elimination of dead space;

Importance of rest.



***Halsted insisted on surgical asepsis and pioneered gloves, gowns and separate clean operating theatres.***



***Latex surgical gloves were invented by Halsted to protect his wife's hands. They were later used to increase asepsis.***