Dr. Harold Griffith was a Canadian anesthesiologist who would see things differently. As one of the anesthetists approached by Wright in 1940, Griffith started putting serious consideration into curare over the next few years. A quiet, humble, and highly accomplished anesthesiologist practicing in Montreal, Griffith always found himself at the frontiers of the field. He was the first to administer cyclopropane anesthetic in Canada, and would soon be the first to introduce postoperative recovery rooms into Canadian practice. With this pioneering resumé, it is no surprise that after two years of discussion with Wright, Griffith courageously decided to begin clinical trials of perioperative Incostrin in 1942. He reasoned that if psychiatrists had been using it safely, so too could anesthetists who were trained in managing its most serious side effect, namely respiratory paralysis.

On January 23, 1942, Griffith and his resident [Enid] Johnson introduced the surgical world to the paralyzing properties of curare. They administered Incostrin to a 20-year-old man undergoing surgery for chronic appendicitis. Complete relaxation of the abdominal muscles was achieved safely and reversibly. Griffith proceeded to use Incostrin in 24 more patients before publishing his most famous case series, where he begins memorably with: “Every anesthetist has wished at times that he might be able to produce rapid and complete muscular relaxation in resistant patients under general anesthesia.” This report marked the advent of a paradigm-shifting practice: controlled muscle relaxation during surgery. Soon after Griffith’s landmark publication, a rush of articles began to fill the literature, until the principle gained widespread acceptance among the global anesthesia community.

There are a number of reasons why muscle relaxation has since revolutionized surgery. It has minimized muscle rigidity, facilitating both intubation and surgical working conditions.

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In intra-abdominal surgery, paralysis has assisted with surgical exposure; in delicate procedures like ophthalmic or neurosurgery, it has prevented potentially detrimental patient movement. In addition to eliminating the need for dangerously high dose inhaled anesthetics, muscle relaxants have enabled the dawn of longer and more complex surgery, including cardiothoracic and organ transplant procedures. Therefore, some 100 years after the famous demonstration of ether anesthesia by Morton at Massachusetts General Hospital, Dr. Griffith’s use of Incostrin emerges as the next historical pillar in the formative years of anesthesiology. Arguably the greatest Canadian contribution to the specialty and one that has vastly expanded the surgical horizon, it is no wonder that historians divide anesthesiology into eras “before and after Griffith.”

It is noteworthy, however, that the acceptance of curare into everyday anesthetic practice was not without resistance. Two years after Griffith’s milestone, a controversial audit published in 1954 by Beecher and Todd stands out as a prominent example. Beecher and Todd studied surgical outcomes at ten major North American hospitals and showed that muscle paralysis was associated with a six-fold increase in anesthetic mortality. Some argued that this increase in mortality reflected the improper use of mechanical ventilation and reversal agents available at the time. Nonetheless, this early paper identified the real dangers of paralysis and led to some important corollaries. Anesthesiologists had to reassess their practice of muscle relaxation and address risks, which continue to shape the practice today. New curare-like drugs with more favourable pharmacological properties have replaced Incostrin and practice guidelines have been established to standardize administration and post-operative care. These improvements have now made muscle paralysis a widely accepted tool in the operating room, albeit one that requires significant training and skill.

Today, muscle relaxation is achieved with a class of pharmaceuticals known as the neuromuscular blocking agents (NMBAs). While curare was the only option some 70 years ago, the modern day anesthesiologist faces a choice among various designer drugs of curare-like origin: cisatracurium, rocuronium, pancuronium and succinylcholine to name a few. Each has a differing pharmacokinetic, pharmacodynamic, and side effect profile, allowing drug selection to be customized to the operation at hand. To add to this armamentarium, there are reversal agents known as anticholinesterases, which can be used to minimize the risks of residual paralysis. Nerve stimulators are further employed to monitor the degree of muscle relaxation and best titrate effects.

In spite of this complexity, it is not to be forgotten that the modern era of muscle relaxation stems from a story that is much more profound and long-standing. The history of curare lends itself to vivid portrayal, from South American hunting poison to mainstay medication in the current operating theatre. Its use in anesthesiology has allowed patients to undergo increasingly complex procedures more safely and with faster recovery. Today, new pharmaceutical research and improved monitoring techniques continue to shape the anesthetic practice of neuromuscular blockade, but the journey of this medication thus far, from arrow tips to syringe needles, must not be overlooked.

The 21st century anesthesiologist gently places the oxygen mask on the patient’s face, as instructions are given to “take a few deep breaths in”. Syringes approach the intravenous line, through which various medications are injected, one after the other like the pistons in a car. The last of these syringes is a translucent fluid labelled ‘Rocuronium 10 mg/mL’. A seemingly innocuous mixture, this powerful intubating agent, must not be overlooked. It is noteworthy, however, that the acceptance of curare into everyday anesthetic practice was not without resistance. Two years after Griffith’s milestone, a controversial audit published in 1954 by Beecher and Todd stands out as a prominent example. Beecher and Todd studied surgical outcomes at ten major North American hospitals and showed that muscle paralysis was associated with a six-fold increase in anesthetic mortality. Some argued that this increase in mortality reflected the improper use of mechanical ventilation and reversal agents available at the time. Nonetheless, this early paper identified the real dangers of paralysis and led to some important corollaries. Anesthesiologists had to reassess their practice of muscle relaxation and address risks, which continue to shape the practice today. New curare-like drugs with more favourable pharmacological properties have replaced Incostrin and practice guidelines have been established to standardize administration and post-operative care. These improvements have now made muscle paralysis a widely accepted tool in the operating room, albeit one that requires significant training and skill.

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