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#### NOTABLE NOTES

### Cryotherapy—As Ancient as the Pharaohs

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In cryotherapy, also known as cryosurgery, cold temperatures are used to treat a wide variety of skin disease in modern dermatology. However, cryotherapy has its humble roots as far back as the Egyptians in 3000 BCE, when cold compresses were used to treat the inflammation of infected wounds.<sup>1</sup> In the fifth century BCE, Hannibal's Carthaginian mercenaries experienced the hemostatic and destructive tissue effects of the cold while crossing the Alps en route to Rome.<sup>2</sup> In the Napoleonic times, cooling was used for anesthesia and amputation. It was not until the mid-1800s when modern use of cryotherapy was born. James Arnott, deemed the "father of modern cryosurgery," was the first to use salted solutions with crushed ice to freeze cancers of the breast and cervix. The temperatures reached  $-18^{\circ}\text{C}$  to  $-24^{\circ}\text{C}$ , which was enough to freeze the tumors and lead to a reduction in size of the lesions and improved pain management. Eventually, Arnott used his cryosurgical device on acne and neuralgia.<sup>3</sup> However, the device did not get cold enough for complete tissue destruction.

It was not until after the industrial revolution when temperatures of  $-190^{\circ}\text{C}$  could be reached to produce and harness liquid air, marking the beginning of the dermatologic cryosurgery era. New York physician Campbell White successfully used this to treat a myriad of skin diseases, from nevi, warts, varicose leg ulcers, and chancroids to herpes zoster and epitheliomas.<sup>3</sup> While this approach was still unachievable at most institutions, solid carbon dioxide became the mainstay of treatment because the temperatures required were half that of liquid air.

However, the method was limited to treating superficial skin conditions less than 1 to 2 mm deep. The post-World War II era further ex-

panded the field by making liquid nitrogen readily available.<sup>2</sup> To fix the problem of inadequate penetration of tissue freezing with available techniques, solid copper discs cooled by submersion in liquid nitrogen became widespread practice. In the mid-20th century, the dermatologists and innovators Douglas Torre and Setrag Zacarian created the first handheld cryosurgery device and brought the first commercial device to market.<sup>3</sup> These pioneers, along with a handful of others, established the field of dermatologic cryosurgery as it is known today.

From the early observations of the Egyptians and Greeks to the practice of cryotherapy using the handheld devices today, the field of cryosurgery has come a long way. The techniques are sound and have been effective in treating a wide array of benign, premalignant, and cancerous lesions. Thus, the ancient technique of cryotherapy will continue to play a role in the modern field of dermatology for years to come.

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