Chronic pain management continues to be a major challenge for the medical profession, and whereas about two decades ago the problem was not adequately addressed, it is gratifying to note that this challenge and its implications is increasingly recognized by almost all segments of the health delivery team. This fact is borne out by the large number of pain centers and pain clinics that have developed nationwide, and this number continues to increase yearly [1]. Unfortunately, the increase in the number of pain facilities has not corresponded with the increase in the quality of chronic pain management. Moreover, the “conquest” of pain is elusive and is still very far from satisfactory resolution. The good news is that tremendous direct and indirect progress is being made at several levels during the process of solving this major scourge of humankind. Testimony of this progress is borne out by the impressive list of pain-oriented scientific papers that continue to be delivered at international, national, and local pain meetings, and also at several medical specialty meetings (notably anesthesiology, neurosurgery, rehabilitation medicine, orthopedic surgery, psychology, and neurology). Nerve blocks have always formed an important part of perioperative pain management and are also a major modality in chronic pain management. At the recently concluded 6th World Congress of Pain held in Adelaide, Australia, an entire plenary session was allocated to postoperative pain. The work of Woolf [2], Kehlet [3], and Handwerker [4] suggest that hyperexcitability of the spinal cord interneurons was the end result of a series of events that resulted from injury (including
surgery), pain, and inflammation. This concept was supported by Cousins [5] et al. and Kehlet [6], who presented data to show that preoperative nerve blocks or nerve blocks immediately postinjury diminish the intensity and severity of subsequent pain. The purpose of this chapter is, therefore, to review some of the more commonly administered nerve blocks and to discuss their relevant application to the management of chronic pain patients.

Before discussing specific nerve blocks and their relevance to pain management, it may be appropriate to review some general considerations that may be helpful in the overall evaluation of nerve blocks as effective modalities in pain management. These considerations include history of nerve blocks; prerequisites for nerve block administration; resuscitation, drugs, and equipment personnel for nerve blocks; the pharmacology of agents used in the performance of nerve blocks; accessories for nerve block therapy; complications of nerve blocks; and mechanism of actions of local anesthetics in nerve block therapy.

**GENERAL CONSIDERATIONS**

**History of nerve blocks**

A possible place for nerve blocks in the archives of pain management was assured as early as 1826 by Mueller [7], who proposed “the doctrine of specific energies of the senses.” This concept stimulated contemporary thought that resulted in the “specificity hypothesis” of pain, as formulated by Schiff [8] in 1858. In 1845, Rynd [9] described the infiltration of morphine in a peripheral nerve for neuralgic pain using a hypodermic needle — this may have been the first documentation of a nerve block. The discovery of the syringe by Pravaz [10] in 1853 contributed to a variety of “neural procedures” by notable researchers, including Wood and Hunter.

Koller, in 1884, first used cocaine topically for eye surgery, and in 1885 Corning described the epidural anesthetic. Reclus proposed infiltration anesthesia in 1890, and Quincke described the lumbar puncture technique in 1891; these advances led the way for the introduction of spinal anesthesia, which was first described by Bier [11] in 1898. A flurry of important events, including the development of local anesthetics, the use of epinephrine for augmenting conduction anesthesia, the development of regional anesthesia, and the formation of national and international pain societies (see Chapter 1) have led to the establishment of an important role of nerve blocks in anesthesia in general and in pain management in particular.

**Prerequisites for nerve blocks**

Nerve blocks may produce significant systemic as well as local effects on the body. For anesthetic purposes, there was an initial misconception that vigilance, which was a monitoring hallmark of general anesthesia, could be relaxed or eliminated when nerve blocks and regional anesthesia were admin-