

# Pain Management in Nursing Practice

# 1

## Leaders in pain care: an historic overview

### Learning objectives

The learning objectives of this chapter are to:

- recognize the origins of understanding and treating pain
- be aware of how social practices across ages influenced cultural attitudes to pain
- be cognizant of some eminent leaders in pain treatment and management
- view a transition from a linear view of pain to a complex systems perspective

### Introduction

This chapter offers a brief overview of the important contributions of some eminent leaders in pain philosophy, medicine and nursing from ancient to modern times, describing the achievements of these leaders within their socio-political and cultural contexts. There was no linear development from ancient to modern times towards understanding mechanisms underpinning human pain experience. Multiple factors, at different times over very lengthy time spans, provided a context for discoveries which improved understanding of mechanisms underpinning pain experience, as well as pain diagnostics, treatment and management (Dormandy, 2006).

### A view of pain from antiquity

One of the few human constants between now and antiquity is the inherent anatomical structure and neurobiochemical function underpinning human physiology,

with the human person living in a social and cultural context. It is now acknowledged and undisputed that pain is a subjective experience and that this experience always takes place in a context which impacts on both how the pain is experienced as well as the meaning of the pain for the person. Prehistoric man viewed pain relief as part of a package bestowed by the gods, which addressed sleep, happiness, hope and joy, and which was handed down and utilized by healers in early civilizations. The viewpoint began to change with the beginnings of Western civilization in ancient Greece, a context of frequent wars, resulting in serious injuries, without knowledge of a central nervous system and only the rudimentary beginnings of study of anatomy and physiology (Dormandy, 2006).

Records of the experience of pain in ancient Greece emphasize the experience of pain related to war and fighting, more than to long-term illness or death and dying. Homer, for example, in the *Iliad* (8th–4th-century BC), used a vocabulary which included descriptions of psychological experiences of mourning, grief and worry as well as acute pains of childbirth and pains related to wounds or stings caused by arrows and sharp objects. The pains caused by the latter gave rise to exhaustion, the pain being alleviated by the removal of the sharp object and ‘remedies that relieve afflictions’ (Rey, 1993). The word ‘suffering’ is used in the *Iliad* in the context of ‘putting up with/working with’ pain and acknowledging the recurrence of pain. Pain in those ancient times was described both in terms of its temporal nature, that is, how long the pain sensation lasted, and the type of pain, for example, ‘sharp’, ‘cutting’, often referring to the instrument which caused the pain (Rey, 1993). Homer’s *Iliad* is a war record of the beginning of Western civilization. Death from injury was described in the context of the person dying, the weapon associated with death and pain, how the weapon entered the body of the person dying and the wound produced. This latter element described painful death as deconstruction of human life. The mortally wounding weapon not only accessed the body of the fighter, but also wounded his close social others. Homer’s *Iliad* portrayed:

the spear that cuts through the sinew of Pedaeus’s head, passing through his teeth and severing his tongue, passes also through the work of goodly Theano, who ‘reared him carefully even as her own children’; the Bronze point that enters Phereclus through the right buttock, pierces bladder and bone, and pierces as well the ship building and craftsmanship bodied forth in this son of Tecton, Harmon’s son. (Scarry, 1985: 123)

## Hippocrates (c. 460–377 BC)

Living in a culture of war, **Hippocrates** was the first ancient Greek physician to change the concept of causes of disease from punishment by the gods to natural causes. Hippocratic medicine focused on observation, and especially the description

of the pain experience provided by the patient to the doctor. Hippocrates took a new perspective of viewing pain as a symptom. With a philosophy that ‘pain signifies’, the elicited pain information formed an essential part of the overall patient examination, contributing to the patient’s prognosis in a system of medicine which viewed illness as a process (Rey, 1993). Hippocrates, known as the ‘Father of Medicine’, taught physicians the guiding principle of ‘first do no harm’ (*primum non nocere*) and required physicians to take the Hippocratic Oath (Boring, 1957; NIH, 2012).

In the books of the Hippocratic collection, written from 430 BC to 380 BC, the various treatises emphasize that the doctor’s duty was to alleviate suffering and to know when to intervene, through interpretation of the patient’s case history. The verb ‘to suffer’ (*poneo*) was used to describe suffering and illness as an experienced state. Pain location, often defined in approximate terms: ‘in the area of’ or ‘about’, as well as playing a role in illness identification, was linked to the type of treatment prescribed. The Hippocratic understanding of the aetiology of pain varied and was without an empirical foundation. As one example, use of the principles of likes and opposites was invoked, with certain pains being considered to be brought on by heat in ‘cold’ people and by cold in ‘warm’ people. Ignorance of anatomy was due to the legal ban on the dissection of human bodies, so medical practice relied on knowledge obtained from animal dissection. Hippocrates, notwithstanding the limitations imposed by these conditions, aimed for objectivity in his medical teachings and practice, turning away particularly from the use of magic and magical potions (Dormandy, 2006; Rey, 1993).

Hippocratism spread to the entire known world. The fame of Alexandria from 331 BC spread as an advanced, intellectual and scientific Hellenistic culture in Egypt. The Egyptians had better knowledge of anatomy than the Greeks because embalming, with dissection, had been practised for thousands of years. In Alexandria, the great Alexandrian anatomists Herophilus (335–280 BC) and Erasistratus (310–250 BC) revealed the brain as part of the central nervous system (Keele, 1957).

## Influences on pain in the first and second centuries AD: Galen and Aristotle

**Galen** (c. 129–199 AD) was a physician to the Roman emperors. He published extensively in Greek and his works, subsequently translated into Arabic and Latin, were, for more than a millennium, considered the definitive medical references. Galen had a profound influence on the medical profession for longer than any other doctor in history (Dormandy, 2006). Also strongly influenced by the dissection work of the Alexandrian anatomists and localizing the mind in the brain (Boring, 1957), Galen placed considerable importance on pain in his work, which emphasized both sensation and perception. Galen devised a humeral system of pathology in which information

characterized by pain, heat, redness and swelling contributed to a differential diagnosis of affliction in various organs. Pain, along with other symptoms, was responsible for identifying unhealthy organs. Galen was responsible for classifying different forms of pain, such as ‘pulsing’, ‘throbbing’, ‘stretching’ or ‘lancinating’, terms which are still used today (Rey, 1993). However, he was very reluctant to use pain-relief potions, especially ‘carotic drugs’, a term which referred, at that time, to medications which could produce stupor or sleep, particularly opium, although he did reluctantly recommend the latter for pain relief but only in older people (Dormandy, 2006).

Galen’s particular contribution was to offer the first systemic thinking about pain, which up to that time in ancient Greek medicine was considered as a diagnostic and prognostic tool and was without a theoretical framework. Galen can also be considered as offering the first definition of pain as ‘the sudden change of temperament (the balance of the four forces of blood, phlegm, cholera and black bile) and the rupture of continuity’ (Cohen, 2010: 88).

Another of Galen’s great contributions to medicine was his re-establishing of the central nervous system as the organ for sensory perception, in contrast to the Greek philosopher Aristotle (384–322 BC), who put forward the concept of correlation of all sensory input by a ‘sensorium commune’ in the heart. While he advanced systemic thinking about pain, Galen had included unsupported anatomical errors and dogma in his writings which would later be refuted by modern scientific evidence. Though there were major differences in both viewpoints across the ages, both Aristotelian and Galenic physiology survived until the end of the eighteenth century. Galen disagreed with Aristotle’s assertion allowing immortality to the intellectual part of the soul. The high importance placed on saving the soul may have been one factor which caused Galen’s work to become obscured under the shadow of Aristotle’s work from the time of the fall of the Roman Empire (Keele, 1957).

## The Middle Ages: Christian and Galenic cultures

Galenic medical tradition, largely published in Greek, was nearly lost to the Latin West after the decline and fall of the Roman Empire. At this time, the need to save the human soul took precedence over everything and determined attitudes to pain. Hospitals and hostels were established in the East and the West to look after the poor and sick and to help those in pain. In the sixth century AD one of the monastic rules composed for the original Benedictine monasteries was: ‘the care of the sick is to be placed above every other duty as if indeed Christ were being directly served by waiting on them’.

By the eighth century, Islam had conquered the Arabian Peninsula and from this time Galen became the supreme medical authority. Galenic medicine was kept alive in the Greek-speaking Asian cultures and passionately translated into Arabic for Muslim cultures. However, it did not go unchallenged, especially regarding pharmacological preparations, at which Islamic chemists excelled (Dormandy, 2006).

## Renaissance and the refuting of Galen's ideas: Leonardo da Vinci and pain

Galenic medicine re-emerged in the West during the Renaissance, which began in Italy in the fourteenth century and spread throughout Europe. Marked by creativity in arts, music, architecture, literature and theology, the Renaissance culture provided the context for medical texts to be translated from their original Greek into Latin and the European languages (Dormandy, 2006). However, while Galenic medicine led the field, by offering a fact-fitting system and overall philosophy, Galen's ideas were now questioned in the light of new anatomical learning. From this time, the search for the truth of anatomy paved the way for the discoveries of the Renaissance; anatomy was a hugely exciting area at that time, and many artists performed dissections and autopsies of human bodies. While **Leonardo da Vinci** (1452–1519) contributed more than 600 anatomical drawings, his experience of human dissection is not known. Leonardo da Vinci attached major importance to pain, commenting:

the chief good is wisdom, the chief evil is body pain. Seeing therefore that we are made up of two things, namely soul and body, of which the first is the better and the worse is the body, wisdom belongs to the better part and the chief evil belongs to the worst part and is the worst. The best thing in the soul is wisdom and even so the worse thing in the body is pain. (Keele, 1957: 61)

## Beginnings of modern science: Cartesian linear theory of pain

Modern science began in the seventeenth century and was accompanied by major contributions to scientific knowledge. For example, Harvey's discovery of the circulation of the blood in 1628 is regarded as the beginning of biological science, and Hooke's experiments with dogs established mechanisms of circulation and respiration. Scientific observations and medicine were breaking free from Galenic views as a consequence of investigations. However, scientific evolution was taking place at different rates in different countries. The nature of pain was reinterpreted at this time, primarily by French philosopher **René Descartes** (1596–1650), who is often referred to as the 'Father of Modern Philosophy'. He believed in a free, insubstantial soul and a mechanically operated body, solving any incompatibility with his theory of dualism. Descartes made an analogy of the human being with clocks and other automata, so that physiology could be seen in terms of matter in motion; using reductive mechanistic philosophy, the machine became the model to explain the living. Descartes equated the soul with the mind and, as only humans had souls, therefore only humans could have mind and consciousness. Mind and body were therefore almost separate.

A devout Catholic, living at a time of inquisitions and punishment for heresies, Descartes aimed to solve the conflict regarding the soul – between religion and science – through dualism (Boring, 1957). In his *Principles of Philosophy* (1644), Descartes explained sensation, and especially pain, as a way of understanding the union of soul and body (Rey, 1993). Descartes put forward the best description of the first theory of pain, known as ‘specificity theory’ (Melzack and Wall, 1982). In *Passions of the Soul* (1649), Descartes described how the soul ‘linked with every part of the body all at once’. He located the soul in the pineal gland because it was a single gland and not replicated. Descartes stated: ‘only one sensation is felt by the soul and there must therefore be only one place where the sensations come together and which permits the nature of the sensation to be well defined’ (Rey, 1993: 75). As shown in Figure 1.1, in a working model used for centuries, Descartes described his linear concept of the mechanism of pain:

If for example fire (A) comes near the foot (B) the minute particles of this fire, which as you know move with great velocity, have the power to set in motion the spot of the skin of the foot which they touch, and by this means pulling upon the delicate thread (cc), which is attached to the spot of the skin, they open up at the same instant the pore (de) against which the delicate thread ends, just as by pulling at one end of a rope one makes to strike at the same instant a bell which hangs at the other end. (Keele, 1957: 72)



**Figure 1.1** Descartes' (1664) concept of the pain pathway

Source: Descartes, R. (1664) *L'homme*. Translated by M. Foster in *Lectures on the History of Physiology during the 16th, 17th and 18th Centuries*. Cambridge: Cambridge University Press, 1901. Cited in Keele, K. (1957) *Anatomies of Pain*. Oxford: Blackwell Scientific

## Anaesthetics and the transition to pain-free surgery

At the beginning of the nineteenth century, pain and suffering were viewed as interwoven into the normal fabric of European and American life, across all socio-economic and occupational divides. Life was very harsh and pain was frequently considered normal; it was not something to be avoided, but rather it provided a foundation for social order. However, attitudes changed dramatically in the first three decades of the nineteenth century so that, by 1840, some doctors considered pain as an evil to be defeated at all costs (Dormandy, 2006).

**Anton Mesmer** (1734–1815) was an eighteenth-century doctor who introduced into his own clinical practice the hypnotic effect produced in patients known as ‘mesmerism’ or ‘animal magnetism’. While there was no general scientific interest in this new phenomenon, successful mesmerism was the forerunner of anaesthesia. In 1837, **John Elliotson** (1791–1868), Professor of Medicine at University College Hospital, London, having personally witnessed an effective demonstration, tried to introduce mesmerism into clinical practice within the hospital. However, the University Council passed a resolution forbidding ‘the practice of mesmerism or animal magnetism within the hospital’ and Elliotson resigned (Boring, 1957).

In India, where there was governmental open-mindedness, **James Esdaile** (1808–1859), having heard of Elliotson’s work, successfully induced analgesia with mesmerism. Between 1846 and 1847 in India, Esdaile demonstrated the effectiveness of mesmerism for anaesthesia and reducing peri-operative shock. He performed many major and minor operations (Boring, 1957). Esdaile had governmental, but not professional, support for his work. While finding mesmerism safer than ether or chloroform in terms of potential side-effects, there was insufficient scientific and medical interest, and too few trained mesmerists available to provide a service for the new norm of surgery under anaesthesia. This placed a burden on the mesmerists. In addition, inducing a trance in some patients required much time (Forrest, 1999). In a newly opened, small, experimental hospital in Calcutta, Esdaile undertook further research on the potential benefits of mesmerism. After carrying out a comparative trial between ether and mesmerism, Esdaile found that ether produced the more profound trance. Esdaile concluded that:

Ether ... will soon become a safe means of procuring sensibility for the most formidable surgical operations ever. ... All Mesmerists ... will rejoice at having a means of bringing to light one truth more, especially as it will free them from the drudgery required to induce Mesmeric insensibility to pain. (Robinson, 1947: 74)

## The first civilian operation under anaesthetic

Ether was the first general anaesthetic to be used to prevent pain in major surgery. The first procedural administration of ether can be attributed to **Crawford Williamson**



**Long** (1815–1878) in America. In March 1842, performing surgery for the first time under general anaesthesia by ether, Long removed a neck tumour from a patient who had delayed the procedure because of fear of pain. The brief operation required the patient to inhale ether throughout. The patient felt nothing and recovered from the operation, according to Long's records. However, while recognizing that discovering the mode of painless surgery would be a massive achievement, Long was extremely cautious about making any claims of the benefits of ether as a general anaesthetic. He could not rule out possible pain insensitivity or the role of suggestion in the operation's success. Although he kept detailed notes, continued to use ether and became a successful surgeon, Long's findings were not published and did not impact on the development of anaesthesia. Long was given recognition through a colleague's publication in 1877, a year before his own death in 1878 (Dormandy, 2006).

While 'gas frolics' were a Victorian social pastime, and were sometimes indulged in personally by medical and dental practitioners, inhalation administration of soporific substances was, in general, considered hazardous, unsafe and uncontrollable in the medical and surgical context. The claim for the discovery of general anaesthesia for surgery was to prove extremely contentious. (Dormandy (2006) provides a very readable account of the unpleasant controversies between experts and charlatans in the fight for recognition of the discovery.)

## General anaesthesia: Horace Wells and William Thomas Morton

At that time communication among pioneers was slow (usually by letter), so sometimes there were cross-communications about events. John Collins Warren, Chief of Surgery at the Massachusetts General Hospital, USA, operated under a glass dome on top of the Bullfinch Building, out of hearing distance from the rest of the hospital. In February 1845, against his better judgement, Warren was persuaded by qualified dental practitioner **Horace Wells** (1815–1848) to allow a demonstration of 'his discovery' of the potential of nitrous oxide for pain-free dental extraction. Wells had witnessed a successful demonstration and personally experienced a pain-free dental extraction in 1844 under nitrous oxide administration. However, on this occasion, the demonstration went badly wrong. Following Wells' administration of the anaesthetic, the patient cried out loudly at the beginning of the extraction and the demonstration had to be abandoned. Wells left the hospital theatre feeling very humiliated. The real triumph occurred for his former student and colleague **William Thomas Morton** (1819–1868) a year later. Morton successfully utilized ether in 1846 in a public demonstration, again at the Massachusetts General Hospital with Warren. This highly successful anaesthetic event and other similar events which followed very shortly, led to an ether revolution in surgical practice which rapidly spread internationally (Clark, 1938; Dormandy, 2006).

**James Young Simpson** (1811–1870), renowned Professor of Obstetrics at Edinburgh University, was fervent about finding a method of painless childbirth. While encountering massive opposition from conservative Kirk ministers, devout laypersons and doctors strongly opposed on religious grounds to relieving the pains of childbirth, Simpson very knowledgeably and successfully fought back and won his arguments (Clark, 1938; Dormandy, 2006).

**John Snow** (1813–1858), the first anaesthetist, became a role model for good practice, high standards and patient safety in surgical anaesthesia, for which he adopted a strong scientific orientation (Snow, 2006). As a trainee, Snow had witnessed the appalling suffering of patients undergoing surgical interventions. Snow's viewpoint, that surgical pain was life-threatening, adding to surgical risks and shock for patients, while serving no physiological purpose, went against the grain of current thinking.

At that time, surgeons considered the ethical imperative was to ensure that patients did not die as a consequence of surgery. Many considered that ether and chloroform increased the risk to patients' lives, although they did provide some benefits. However, patients were now aware that pain-free surgery was possible and they therefore more readily consented to operations. While it was recognized that ether and chloroform, although giving pain-free surgery, were very risky, patients were often willing to take the risk rather than experience the pain. Snow believed passionately that anaesthesia protected against shock and the risks of surgery, and that the pain of surgery posed a greater risk to patients' lives than correctly administered anaesthesia. To this end, Snow adopted a rigorous scientific approach to discover the properties and conditions required to enhance the safety of anaesthetics. Snow compared the physical, chemical and pharmacological characteristics of a group of volatile anaesthetic agents and identified their primary physiological characteristics.

Snow recommended that all fatalities should be investigated and insisted on the high-quality and purity of anaesthetic agents. Adherence to Snow's recommendations, with safety being a major element of anaesthesia practice, has had a long-term and continuing impact on the practice of anaesthetics. Snow kept three case books in which he detailed 4,500 anaesthetic administrations in London hospitals and his private practice between 1848 and his death in 1858. Acknowledged to be the most skilled administrator of his day, Snow recorded the anaesthetic used, the procedure, who administered the anaesthetic, the surgeon and the patient's views on the anaesthetic, providing invaluable and accurate accounts of surgical practice of surgery and dentistry in 1850s. While surgical mortality and post-operative infection remained unchanged until the 1870s, Snow's substantial addressing of the problem of pain in surgery led to radical changes in thinking and practice regarding surgery (Snow, 2006).

In 1853, Snow administered chloroform to Queen Victoria when she was delivered of Prince Leopold, and again two years later, when she gave birth to Princess Beatrice. In her diary, Queen Victoria described the effect of chloroform as 'soothing, quieting and delightful beyond measure'. Her affirmation of 'that

blessed chloroform', as Queen Victoria described the gas, greatly helped to change attitudes in the medical profession and worldwide to painless childbirth (Dormandy, 2006).

## Anaesthesia, military wounds and pioneers at the Crimea

The horrendous injuries, infections and loss of life sustained by wounded soldiers in the Crimean War (October 1853–February 1856) provided the, albeit contentious, learning context for appropriate anaesthesia in military practice. Snow delivered a lecture to medical personnel of the United Services Institution in May 1847, on the benefits of ether for pain and shock prevention, less than a year after the arrival of anaesthesia to Britain. Snow stated that 'the pain of a surgical operation is greater than that of the wound itself ... a great part of the danger of an operation consists in the pain of it, which gives a shock to the system from which it is sometimes unable to recover'. Snow determined that 'the wounded man suffers two shocks together, that of his wound and that of the operation' (Connor, 1998: 161).

On the Russian side of the Crimean War, **Nikolai Pirogov** (1810–1881), now considered the Father of Field Surgery, having gained extensive experience using ether anaesthesia in the military field context from 1847, utilized his renowned surgical skills with great effectiveness in the Crimean War. British Army surgeons at the Crimea had little or no experience of the new technology, and consequently administration of both ether and chloroform at their military field hospitals was, initially, managerially and practically problematic (Connor, 1998). Graphic accounts from Constantinople, by the *Times* correspondent, of wounded soldiers suffering in appalling conditions, with gross lack of facilities, their even basic needs unaddressed, caused public outrage.

Sidney Herbert, as England's Secretary at War, personally asked **Florence Nightingale** (1820–1910) to go to the Crimea to improve the organization of the care of the severely suffering wounded soldiers, who were being denied even the barest necessities. Nightingale, having by then acquired experience as a volunteer nurse in Prussia, England and Paris, was assigned by Herbert to reorganize the British Army Medical Department supplies and improve nursing standards of care for the wounded. Regarded as the Founder of Modern Nursing, Nightingale adopted a highly strategic approach to gain the confidence and cooperation of the British Army, and successfully revolutionized the management of army, housekeeping and nutritional supplies and nursing care of the wounded soldiers. Countless operations took place on the battlefields, affording a massive learning experience for the effective use of ether and chloroform. Nightingale attended as many operations as she could to ease patient suffering and strengthen the patient by her presence.

## Safety concerns about the choice of anaesthetic for surgery

The experience provided by caring for extensive battle injuries added to the recognition for the need to address surgical pain (Harmelink, 1971; Pollard, 1891). By the 1860s surgeons recognized that it was a duty to their patients to reduce both the risk of fatalities and protect patients from surgical pain and the consequences of surgery in terms of shock and haemorrhage (Snow, 2006).

For the century following from 1846–1847, ether, nitrous oxide and chloroform were the most important of known anaesthetic agents (Clark, 1938). There were serious debates between American and British doctors over the choice of whether ether or chloroform was the safer anaesthesia. In 1871, the *British Medical Journal* decided that ether was preferable to chloroform as the latter was responsible for many deaths which were not effectively investigated. Progress in scientific accuracy depends on the availability of the appropriate technology. By the 1930s it was possible to demonstrate, in the laboratory context, that **cardiac syncope** was linked with chloroform administration (Clark, 1938). Nitrous oxide (laughing gas), discovered and developed by **Joseph Priestley** in the 1770s, was further experimented on by **Sir Humphry Davy** (1778–1829), who stated in research published in 1800 that: ‘since nitrous oxide appears capable of totally destroying physical pain, it could probably be used with advantage during not unduly prolonged surgical operations in which no great effusion of blood takes place’ (Dormandy, 2006: 165). While this recommendation was not acted upon for 50 years as doctors considered the potential for side-effects was too hazardous, nitrous oxide with oxygen as anaesthesia was in use in Great Britain by 1870, 70 years after Davy’s research conclusions about the potential efficacy of this anaesthetic combination (Clark, 1938).

## Major shift to systems theory perspectives on pain

The **Second World War** provided the context for more intense learning of the consequences of severe wounds sustained by soldiers. In 1959, **Henry Knowles Beecher** (1904–1976) published accounts of his clinical experiences as a senior anaesthetist in the US Army working with soldiers who had been severely wounded in battle in North Africa and Italy. When the soldiers arrived into the combat hospitals, only one in three required immediate morphine analgesia for their pain. Beecher’s work highlighted the importance of context and the subjective meaning of pain for pain perception. Beecher attributed the soldiers’ lack of need for immediate analgesia to their relief at having escaped alive from the appalling conditions on the battlefield (Melzack and Wall, 1982/1988).

**John Bonica** (1917–1994), in his youth, assumed responsibility for his Sicilian family as immigrants in New York. Bonica paid his way through medical school

as a professional exhibition wrestler, consequently suffering many chronic joint aches. In 1944 Bonica was appointed Chief Anaesthetist of a 7,000-bed Army hospital, caring for 10,000 wounded soldiers from Asia and Europe, whose suffering inspired his lifelong dedication to the management of pain. He published his ground-breaking book *The Management of Pain* in 1953, declaring ‘war on pain’. Two beliefs sustained his determined ideology:

- first, that the pain deserved to be treated even when its cause was unknown or untreatable; and
- second, that such treatment could be effective only through the combined effort of doctors, nurses, psychologists, physiotherapists, and, when indicated, other health professionals (Dormandy, 2006).

Bonica’s major contribution was the concept of the **multidisciplinary pain clinic**, which was revolutionary to conventional practice and met a recognized, unmet need of under-treated pain. Pain had never been part of the learning curriculum. The consequence for this was raised awareness of the growing problem of chronic pain, especially pain which had no apparent or certain origin. Bonica organized the first international symposium on the treatment and management of pain in Seattle in 1973, leading to the establishment of the **International Association for the Study of Pain (IASP)**. He published prolifically and had an immense influence on improving standards of care in pain management. In a letter to the editor, published in 1979 in the journal *Pain*, the peer-reviewed journal of the IASP, Bonica commented that, according to his extensive experience, most injuries are accompanied by pain shortly after injury. Bonica recognized the need for intensive pain research in all areas, especially in the growing area of **neuroscience**. In the same letter, Bonica commented:

Pain is the net effect of incredibly complex interactions of ascending and descending neural systems, biochemical, physiologic, and psychologic mechanisms and neocortical processes that involve dynamic, constantly changing activities in most parts of the nervous system which occur simultaneously. By the time that pain is perceived, it has been submitted to the action of many of these neural systems. Consequently, it cannot be artificially dichotomized into sensory pain and pain associated with emotional components. (Bonica, 1979: 204; see also Cope, 2010; Meldrum, 2003)

**Dame Cicely Saunders** (1918–2005) who, because of chronic back pain, had left her career as a qualified nurse at St Thomas’s Nightingale School of Nursing, London, to become a medical social worker, witnessed, as a hospice volunteer, the untreated pain of patients at end of life. Saunders decided to become a doctor to start a home for the dying to better fight the problem of pain, qualifying in 1957. Saunders, now considered as the ‘Mother of Palliative Care’, and known for her outstanding leadership and personal qualities, especially her tenacity and dogged determination, developed a modern strategy for hospice care and introduced a new philosophy and practice for care at end of life, particularly for patients with cancer pain. Saunders sought to convince the medical community that it was totally unnecessary for

patients with cancer to die in pain. Her philosophy was founded on the principles of prevention rather than the alleviation of pain, combined with a thorough understanding of available pain relieving drugs (Clark, 2002).

Saunders was the first doctor to focus her work entirely on end-of-life care, based on the conviction that the then prevalent medical attitude to cancer pain of 'there is nothing more we can do' had to be changed to 'we must think of new possibilities of doing everything'. Saunders developed the concept of '**total pain**' by addressing the social, emotional-psychological and spiritual elements of the patient's quality of life and that of their close others, recognizing the interaction of mind and body and the link of mental distress to bodily pain. In 1963 Saunders stated: 'if physical symptoms are alleviated, then mental pain is lifted also'. Saunders' approach to the care of patients in pain required that healthcare professionals, especially doctors and nurses, listen to the meaning of the pain for the patient and try to understand their experience of suffering, recognizing that their pain was not separate in terms of mind and body, but linked to the person and their social context (Clark, 2002).

## Melzack and Wall's Gate Control Theory

Studies in the nineteenth and early twentieth centuries had recognized the possible existence of mechanisms of suppression and regulation of pain information input in different areas of the spinal column. These threads of information were linked by **Melzack and Wall's** (1965) highly influential **Gate Control Theory**. Psychologist Ronald Melzack met physiologist Patrick Wall when they both worked at the Massachusetts Institute of Technology in the 1950s. Their Gate Control Theory provided a strong rationale to move away from the Cartesian, linear view of pain physiology to a contemporary systems approach. It led to an understanding of how the brain filters, selects and modulates inputs and recognized that social, emotional and psychological factors were an integral part of pain processing. From a systems perspective, the Gate Control Theory provides a mechanism to explain how the encoding system – the brain and spinal cord – can change its input-output function both up and down (Yaksh, 1999). Melzack and Wall's (1965) Gate Control Theory and the work of Saunders and Bonica were heavily influenced by the relevancy of systems theory in healthcare.

Together with major advances in knowledge of human and animal anatomy and physiology, and in technology, these salient contributors have changed how pain is now viewed. The person experiencing pain is now seen as being inseparable from their social and cultural context, and it is a person's human right to be believed and have their pain treated. Other contributors, who have not been included in this overview because of space constraints, have also helped to influence the change to a more humanitarian approach to the care of the patient in pain.

## Chapter summary

- The perspective of holism practised in early civilizations towards the care of sick people altered with the beginnings of Western civilization in ancient Greece, within the context of frequent wars and the rudimentary beginnings of the study of anatomy and physiology.
- Hippocrates changed the concept of the causes of disease from punishment by the gods to natural causes: Hippocratic medicine focused on the patient's subjective pain experience. The major philosophy was that 'pain signifies'.
- The long-time cultural practice of post-mortem human dissection and embalming in ancient Egypt gave third-century BC Alexandria a high status in terms of improved scientific knowledge and the anatomical basis for medical practice.
- Diverse Aristotelian and Galenic viewpoints survived until the end of the eighteenth century. Galenic medicine, obscured by Aristotelian viewpoints in the Western world, had supreme authority in Islamic, Asian and Muslim cultures.
- Galenic medicine re-emerged in the West at the Renaissance, with the re-discovery and translation of texts into European languages. Errors from former Greek knowledge were recognized and progress occurred at varying rates in different countries.
- French philosopher René Descartes located the soul in the pineal gland, offering an alternative to Aristotelian thinking (which had located the mind in the heart). He explained sensation, and pain, as a way of understanding the union of soul and body. Descartes described the best-known specificity theory of pain.
- In the nineteenth century, anaesthesia transformed surgery and childbirth. John Snow, the first anaesthetist, focused on improving patient safety, especially by reducing the shock of surgical pain, by keeping excellent records and by promoting quality and standards in patient care.
- The Crimean War and, later, the First World War provided an horrific and contentious learning context for treating the pain and suffering of wounded soldiers. Experiences during the Second World War influenced the declaration of war on pain. The post-war application of systems theory to pain prompted a biopsychosocial focus to patient care.

## Reflective exercise

Consider how a transition from a linear to a complex systems theory approach to pain may improve standards of care for patients with pain.

## Recommended reading

Cervero, F. (2014) *Understanding Pain: Exploring the Perception of Pain*. Cambridge, MA: MIT.

Dormandy, T. (2006) *The Worst of Evils: The Fight against Pain*. New Haven, CT: Yale University Press.

Melzack, R. and Wall, P.D. (1982/1988) *The Challenge of Pain*. London: Penguin.

Morris, D.B. (1993) *The Culture of Pain*. Berkeley, CA: University of California Press.

## Websites relevant to this chapter

Comprehensive overview of the history of pain:

<http://unitproj.library.ucla.edu/biomed/his/painexhibit/index.html>

Ancient plays depicting psychological and physical wounds inflicted by war:

[www.philoctetesproject.org/](http://www.philoctetesproject.org/)

Greek Medicine, History of Medicine Division, National Institutes of Health (2012):

[www.nlm.nih.gov/hmd/greek/greek\\_oath.html](http://www.nlm.nih.gov/hmd/greek/greek_oath.html)

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