



UNIVERSITI MALAYA

INAUGURAL LECTURE



RELIEF OF PAIN AND SUFFERING:
FROM ANTIQUITY TO MODERN TIMES

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BIODATA

Professor Ramani Vijayan graduated from Osmania University in Hyderabad, India with an MBBS. She was awarded gold medals by the University and the College for being the best outgoing student in that year and for obtaining the highest marks in Medicine. In 1979 she obtained the Fellowship of the Faculty of Anaesthetists, Royal College of Surgeons in Ireland and the Fellowship of the Faculty of Anaesthetists, Royal College of Surgeons in England. She joined the Department of Anaesthesiology, Faculty of Medicine, University of Malaya in 1980 as a lecturer, was promoted to Associate Professor in 1984 and to Professor in 1994. She became a Fellow of the Australian and New Zealand College of Anaesthetists in 1995 and a Fellow of the Academy of Medicine of Malaysia in 1997.

Professor Ramani Vijayan's main clinical and research interests are in the management of pain - acute, chronic and cancer pain. She helped establish the first chronic pain clinic in Malaysia in University Hospital, Kuala Lumpur in 1988 for the management of patients suffering from chronic pain. She set up the Acute Pain Service for the management of postoperative pain in University of Malaya Medical Centre in 1992, again the first such service in Malaysia. Her other interests are in anaesthesia for neurosurgery, regional anaesthesia and clinical pharmacology.

She is currently the President of the College of Anaesthesiologists, Academy of Medicine of Malaysia, President of the Malaysian Society for the Study of pain and Secretary of the Asia-Oceanic Society of Regional Anaesthesia and Pain Medicine, in addition to being a member of numerous other professional societies. She has published numerous papers in several national and international journals including chapters in books. She is the founder editor-in chief of the ASEAN Journal of Anaesthesiology and is on the editorial board of the journals, Acute Pain and International Monitor. Professor Vijayan has been an invited speaker at many conferences, both national and international, including the World Congress of Anaesthesiology in 2000 and the World Congress on Pain in 2002.

RELIEF OF PAIN AND SUFFERING: FROM ANTIQUITY TO MODERN TIMES

Introduction

"We must all die. But that I can save him from days of torture that is what I feel as my great and ever new privilege. Pain is a more terrible lord of mankind than even death itself." Thus did Albert Schweitzer, the great humanitarian, physician and Nobel Laureate; elegantly describe the nature of pain and the obligation and privilege of physicians to relieve it - in 1931 after two decades of medical practice in the African jungles.

Today, as then, proper management of pain remains one of the most important and pressing issues of society in general and health professionals in particular. This lecture attempts to trace how this has been achieved over the centuries, illustrate the history of pain research and highlight some of the advances in pain management that have come about in the last half century.

Historical perspective

Pain has been a major concern of humankind since our beginnings, and it has been the object of ubiquitous efforts to understand and control it. The unearthing of prehistoric human skeletons has revealed bones, which are indelibly stamped with signs of painful diseases.² (Fig 1.)

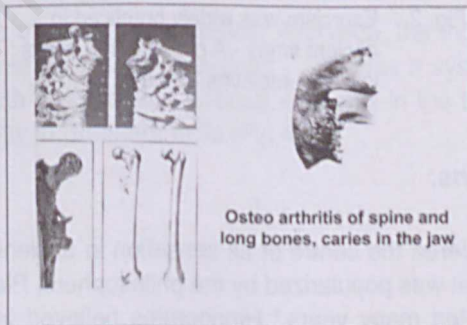


Fig 1. Evidence of pain through the ages

In records of every race one finds testimonials to the omnipresence of pain. Prayers, exorcisms and incantations bearing testimony to this are found on Babylonian clay tablets, in papyri written in the days of the Pharaohs, in Persian leathern documents and so on. It has also been one of the greatest factors to affect the course of human events. It is therefore natural that humans should have engaged their energies to understand the nature of pain and make attempts to control it.

The cause of painful disease or pain inflicted by a foreign object was linked with intrusion of magic fluids, evil spirits or pain demons in the body. Treatment consisted of extracting the object or making efforts to ward off or appease the demons with rings, talismans or tiger claws.³ The shaman or medicine man became a symbol of pain relief - as he was called in to exorcise these demons. This is a practice that survives to this day and age in some societies, particularly when modern medicine is unable to provide the solace or comfort that is sorely needed. (Fig 2) In addition of course herbal concoctions, known to be effective for pain relief were widely used.

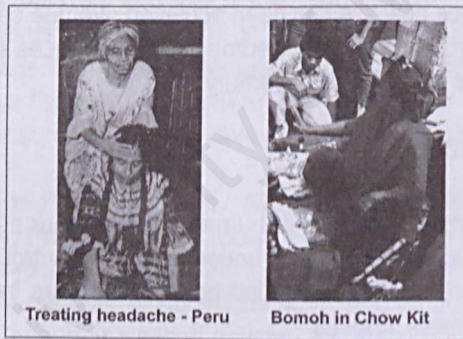


Fig. 2. Exorcism was widely practiced in ancient times - A practice that exists in many societies till today

Ancient civilizations:

The heart was considered the centre of all sensation in ancient times - (Egypt and Greece) a concept that was popularized by the philosophers, Plato and Aristotle and was an idea that lasted many years.⁴ Hippocrates believed in the four humours: blood, phlegm, yellow bile, black bile and pain was when one of these humours was in excess or deficit.⁵ It was Galen, in the 2nd century A.D, who established the

importance of the central nervous system and who defined several classes of nerves. However, despite Galen's great contribution on the function of the nervous system, the Aristotelian concept of the five senses and pain as a 'passion of the soul' felt in the heart, prevailed for many centuries.⁶

Ancient China: The Chinese concept of the 'yin' and the 'yang' - two opposing unifying forces that are in balance and assist the vital energy called 'chi' to circulate to all parts of the body via a network of meridians.⁷ Acupuncture therapy at one or more of these points located on these meridians corrects imbalance and thus eliminates pain and disease. This is a concept that has come down through the ages and is still in widespread practice. (Fig. 3)

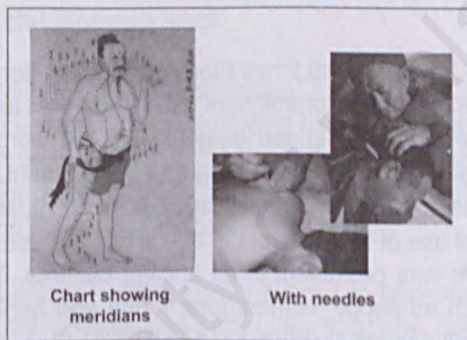


Fig 3. Acupuncture was practiced in China since Ancient times - A practice that is still widespread

Ancient India: In the other great civilization, Ayurveda, the Indian system of herbal medicine and oils was extensively practiced - This was a system, which used and continues to use both physical and spiritual elements in the treatment of maladies and thrives to this day in Southern India.(Fig 4)



Fig 4. Ayurveda in India - Medicinal herbs / oils

Ancient Remedies: During ancient times there was a transition from attributing the cause of pain to evil spirits to the commitment of sins and pain as a sign of retribution or punishment inflicted by an offended deity. In fact the word **pain** in English is derived from the Latin word '**poena**', meaning punishment.^{3,6} Priests replaced medicine men and used natural remedies in addition to rituals and prayers. The origin of the medicinal use of herbs is lost in antiquity.⁷ The use of analgesic agents derived from plant life was prominent in all ancient cultures. The earliest records relate to legends such as poppy, mandragora, hemp and henbane.³ These plants figure prominently in all ancient civilizations: (Fig 5)

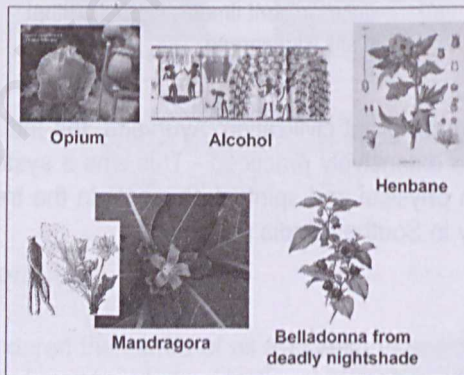


Fig 5. Remedies for pain relief

Babylonian clay tablets show a remedy of a mixture of henbane seeds mixed with gum elastic for dental caries; The Ebers papyrus (circa 1500 B.C) shows many prescriptions with opium for headaches. Such anodynes also figure prominently in Greek mythology and legends of the Odyssey and Iliad.⁸ In addition, the Assyrians used surgical methods such as trephine of the skull for headache and physical procedures such as exercise, heat, cold and massage. The ancient Chinese not only used acupuncture but also moxibustion, dietary regimes, massage and physical exercise. Electrotherapy from the shocks of the electric Nile fish and torpedo fish was used for the treatment of neuralgia and headache.⁹ Such remedies of course did not in any way enhance our understanding of pain in those times - nevertheless these regimes are not dissimilar to the current practice of treating chronic pain.

Middle ages and the Renaissance.

Although in the Middle Ages the philosophy of Aristotle was dominant, it gradually changed when the centre of medicine shifted to Arabia where Avicenna (circa AD 980-1038) proved to be the dominant figure. Avicenna was particularly interested in pain and in means of relieving it and continued to use exercise, heat, massage in addition to opium and other natural drugs.¹⁰

The Renaissance fostered a great scientific spirit to encourage many remarkable advances in chemistry, physics and particularly anatomy. Following Galen's work, and his remarkable work on dissection of the human body, the brain was considered the centre of all sensations and specific sensations were attributed to nerves. This can be seen in the remarkable work of the great scientist and artist Leonardo de Vinci. Apart from this shift from the heart to the brain there were virtually no advances in *pain therapy*. The use of opium and other anodyne herbs flourished along with electrotherapy. The 'soporific sponge' made its appearance, which was really a sea sponge saturated with the juices of opium, hyoscine, and mandrogora for the relief of pain and to produce insensibility to surgical procedures.^{3,11} Many patients preferred to die than undergo surgery because of the pain, and surgery largely consisted of lancing abscesses or amputations.³

Seventeenth and Eighteenth centuries.

In the 17th century, William Harvey had discovered the circulation of blood, but he still clung to the old Aristotelian concept and believed that the heart was the site of pain.¹² Rene Descartes however, adhered to Galenic physiology and considered the brain

as the seat of sensation and motor function. From his extensive anatomic studies, he considered nerves as tubes that contain large number of fine threads that form the marrow of the nerves and connect the proper substance of the brain with nerve endings in the skin and other tissue.¹³ Sensory stimuli were transmitted to the brain by means of these threads. (Fig 6.)

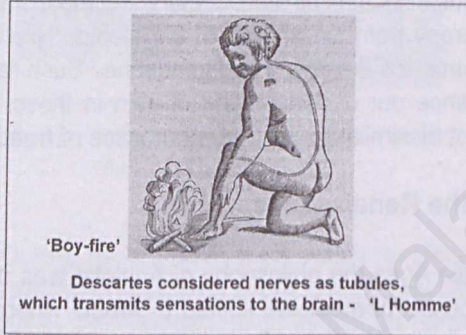


Fig 6. Rene Descartes (1664)

This figure depicts the famous drawing 'boy-fire,' which was used by Rene Descartes (- circa 1664 AD) in his book 'Le Homme'. to elegantly illustrate this concept and was the precursor of the specificity theory that was introduced two centuries later. We are now seeing the beginning of the modern concepts of neuro-anatomy.

The 18th century was ushered in with the same concepts on the nature of pain and the same methods for its control as had been advocated during the preceding centuries. The idea of the heart as the centre remained parallel to the theory that the brain was the centre of sensory perception. There was significant progress in the knowledge of the anatomy and physiology of the central nervous system including the sympathetic nervous system. It was only in the latter part of the 18th century that a new era of analgesia was initiated with Joseph Priestley's discovery of nitrous oxide and the subsequent observation made by Sir Humphery Davy of the analgesic properties of this gas.

Nineteenth Century.

In the early 19th century, physiology emerged as an experimental science. This development led to the scientific study of sensation in general and pain in particular. Bell and Magendie^{14,15} demonstrated with animal experiments that the function of the dorsal roots of the spinal nerves is sensory and the ventral roots are motor. The impetus to the scientific study of pain was further enhanced by the writings of Johannes Muller, (circa 1840) who proposed "The doctrine of specific nerve energies"¹⁶. This stated that the brain received information about external objects and body structures only by way of sensory nerves and the sensory nerves for each of the five senses carried a particular form of energy specific for each sensation. He recognized only the five classical sensations: sight, hearing, smell, taste and touch - the sense of touch included all the experiences that we derive from stimulation of the body including sensations of itch, heat, cold and pain. It established the brain as the centre responsible for sensation and provoked much discussion and research on all aspects of pain.

Pain Therapy. Significant advances were made in pain therapy in the nineteenth century.

- 1) Among the important ones was the isolation of morphine from the crude opium by Serturmer in 1806 and the development of techniques to isolate pure crystalline drugs from previously crude and uncertain mixtures. (Fig 7)

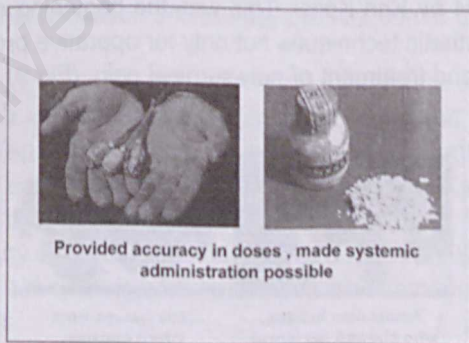


Fig 7. In 1803, Friedrich Serturmer - isolated crystals from crude opium and called it Morphine, after Morpheus, the Greek God of dreams

- 2) A milestone in the prevention and treatment of pain was Morton's public demonstration, in 1846, of the anaesthetic properties of ether, which led to the development of general anaesthesia and this resulted in tremendous advances in surgery. (Fig 8A which shows surgery before ether anaesthesia - Fig 8B -ether anaesthesia)

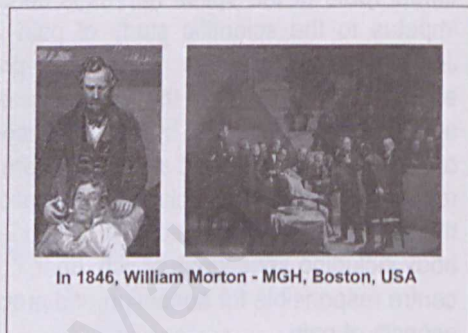


Fig 8A. Surgery before Anaesthesia

Fig 8B. First public demonstration of the use of **ETHER** for surgery

- 3) The development of the hypodermic needle and syringe, which permitted the injection of analgesics.
- 4) The isolation of cocaine from the coca plant (South American), a study of its pharmacological properties and the demonstration of its local anaesthetic efficacy in 1884 by Karl Koller. This was the beginning of widespread use of regional anaesthetic techniques not only for operative procedures but also for the diagnosis and treatment of non-surgical pain. (Fig 9)



Fig 9. Discovery of the numbing properties of 'Coca leaves'

- 5) The development of psychotherapeutic methods of treating disease, which were to have a bearing on the current methods of managing chronic pain.
- 6) The introduction of acetylsalicylic acid (marketed by Bayer as aspirin) - a compound found naturally in willow bark or meadow grasses - circa 1897.
- 7) Advances in physical therapy including electrotherapy, hydrotherapy, thermotherapy and mechano-therapy.
- 8) The development of neurosurgical techniques for managing several types of chronic intractable pain.
- 9) Discovery of X-rays (Roentgen), which ushered in the era of radiation therapy for many painful conditions.

Twentieth Century.

Pain theories. The latter part of the 19th and first half of the twentieth century saw several conflicting and fiercely debated concepts about the nature of pain and two physiological theories of pain, the *specificity theory*^{17, 18} and the *intensive theory*^{19, 20} were formulated. The specificity theory stated that pain was a specific sensation, with its own sensory apparatus, independent of touch and other senses. The intensive theory proposed that pain results from excessive stimulation of the sense of touch. Much research and data were published to support both the theories. Both these theories were embraced by physiologists who opposed the traditional Aristotelian concept that pain was an affective quality. In an effort to reconcile the views of physiologists with those of philosophers and psychologists, Strong, then president of the American Psychological Association, suggested in 1895 that pain consisted of the original sensation and the psychic reaction or displeasure provoked by this sensation.²¹

The great British physiologist, Sherrington,²² proposed a key concept of nociception - pain as an evolved response to a potentially harmful 'noxious' stimulus - he insisted that the essential function of the nervous system was the coordination or integration of activities of the various parts of the organism. The function of pain, to the twentieth century scientist, was no longer to heal, to punish, or to ennoble, but to provide a mechanical warning of actual or potential damage to cells and tissues in specific body areas.

Although many eminent physiologists supported the intensive theory, by the middle of the twentieth century, the specificity theory prevailed and became widely taught. However, despite Sherrington's emphasis on integration, the idea of a

specific pathway for pain (the Cartesian model) linking peripheral receptors to spinal neurons to brain receptors, which produce a motor response- the telephone exchange model or the hard-wired model became dominant in neurophysiology.

There were however, some puzzling aspects that did not fit into these theories - such as the phenomenon of being able to have the skin or cheek pierced without feeling pain or the phenomenon of phantom limb pain and sensation, i.e. pain in a non-existent limb. New data acquired during the 1950s led Melzack and Wall to reappraise the specificity and intensive theories. They concluded that scientific evidence suggests that pain is not caused by neural activity that resides exclusively in nerve pathways traditionally considered specific for pain, but is a result of activity in several interacting neural systems, with its own specialized function. Melzack, a Canadian psychologist and Wall, a British neuroanatomist, published their theory in 1965 and called it the "The Gate Control Theory of pain."²³ This theory took into account the evidence of physiologic specialization, central summation, patterning, modulation of input, and the influence of psychological factors. Although fiercely debated at that time, it has been described as the "most influential ever written in the field of pain."

Gate Control Theory of Pain. (Fig 10)

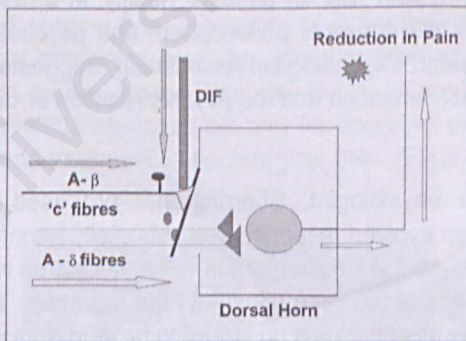


Fig 10. Gate Control Theory - Large A-β fibres and Descending inhibitory fibres (DIF) reduce c fibre input

Fig 10. shows a cartoon diagram of the cells in the dorsal horn of the spinal cord with its connections - both peripheral and central. The theory is based on the following propositions:

- a) The transmission of nerve impulses from afferent fibres to the spinal cord cells is modulated by a spinal gating mechanism in the dorsal horn.
- b) The spinal gating mechanism is influenced by the relative amount of activity in the large-diameter-L (touch, proprioception) and small-diameter (S) - (pain) fibres; activity in the large fibres tends to inhibit transmission (closes the gate), whereas activity in small fibres tends to facilitate transmission (opens the gate).
- c) The spinal gating mechanism is influenced by nerve impulses that descend from the brain.
- d) A specialized system of large-diameter fibres rapidly activates selective cognitive processes that then influence, by way of descending fibres, the modulating properties of the spinal gating mechanisms.

This new concept moved the perception of pain away from a rigid hard-wired system, which responds one on one to a stimulus, but provides for the infinite changes and permutations that is seen in the nervous system. It proposed that the dorsal horn of the spinal cord, in fact the nervous system in general, is in a constant dynamic state and is capable of infinite modulation both by peripheral and central input - either enhancing or reducing pain perception, i.e. capable of plasticity. It has stood the test of time and has resulted in the 'golden age of pain research' - an unprecedented interest in pain research and management.

The use of the transcutaneous electrical nerve stimulation (TENS) modality for pain relief, which stimulates the touch and vibratory nerve endings, is a practical example of the working of the gate.

Other important landmarks in the twentieth century.

- 1) The discovery of opioid receptors in the brain and spinal cord by Pert and Synder in 1973²⁴ and soon after the discovery of its endogenous ligands, enkephalins and endorphins by Kosterlitz.

The Gate Control theory as well as the discovery of opioid receptors and their ligands triggered an unprecedented interest in pain research. This has

unraveled the intricacies of dorsal horn pharmacology - leading the way to designer drugs, and novel routes of drug administration and eventually to better pain treatment.

- 2) Recognition of Chronic Pain not as a symptom but as a disease that needs special expertise - and the establishment of Pain Management Clinics and Centres.
- 3) Organization and setting up of Acute Pain Services for the management of postoperative pain in particular.
- 4) Establishment of organizations such as the International Association for the Study of Pain, World Institute of Pain etc; establishment of many journals such as 'Pain', 'Pain and Symptom Management' etc. - all with the single motive of increasing our understanding of pain and improving pain management for the benefit of our patients.

All these preceding theories have been proposed to explain the mechanisms of pain caused by damage of body tissues, peripheral nerves, the central nervous system or both. However, since the 1960s there has been an increasing recognition that chronic pain can occur in the absence of tissue damage or other organic pathology. Merskey and Spear²⁵ surmised that the highest incidence of pain was found in patients with neurotic disorders, especially hysteria. These patients feel and describe their pain in the same terms as patients with demonstrable pathology and that this psychogenic pain is as real to these patients as pain caused by somatogenic disorders. Pain research by psychologists has expanded our knowledge of the role of learning, culture and cognition; psychological, emotional, motivational factors and environmental influences on pain and pain behaviour.²⁶

Pain Management in Modern Times will be discussed from three aspects: Chronic pain, Acute Pain and Cancer Pain

Chronic Pain - and Multi-disciplinary Pain Management Clinics

By the middle of the twentieth century, acute pain associated with surgery and acute trauma was more or less under control. Advances in anaesthetic agents, techniques and introduction of intensive care units allowed surgery in all branches to proceed and develop at a tremendous rate.

However, many clinicians throughout the ages were puzzled by the phenomenon of chronic persistent pain in some of their patients. Phantom limb pain and causalgia, such as first described by Weir Mitchell was even more puzzling. After an injury had healed, a patient experienced intense burning pain and sensitivity to even the slightest touch. Or patients who had complete avulsion of the brachial plexus and complained of severe episodic pain from the elbow downwards, although they had no normal sensation in the arm and had no motor power. During World War II Beecher made some important observations on pain in men wounded in battle.²⁷ His publication persuaded the medical community that the experience of pain is not always proportional to tissue damage and that many other factors modify pain.

During the war Bonica²⁸ and Alexander²⁹ developed broad views on pain and its management. They were the first physicians to appreciate the difficult problems presented by chronic pain patients. They saw that persistent pain was further complicated by increased suffering, depression, psychological problems and drug abuse. They also realized that the solution of complex pain problems requires vast knowledge and clinical experience, more than one individual can possess. Both Bonica (an Anaesthesiologist) and Alexander felt that patients with chronic pain could be best managed by a *team* of organized specialists representing different disciplines who are knowledgeable and interested. From these ideas and initial experiences, the concept of the Multi-disciplinary team approach to management was born. The first Multi-disciplinary Pain Management Centre was established at the University of Washington, Seattle, USA in 1960. This clinic has since served as a prototype for hundreds of such clinics all over the world.

Chronic Pain Management.. Chronic pain is a complex experience and not simply a biological event. It is pain that exists beyond the period of healing and often in the absence of obvious pathology. This increases the likelihood that psychological and environmental factors will contribute to emotional and physical distress and thus an exaggerated perception of pain.^{26, 30}

When patients are first seen in these clinics, they are often spiraling downwards in several viscous cycles. (Fig 11).

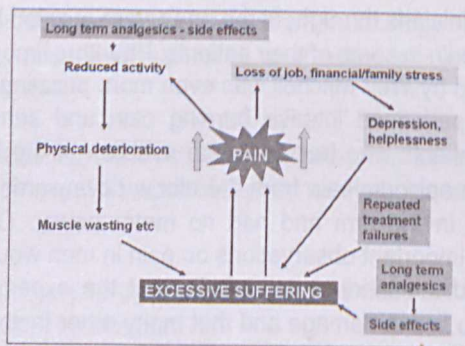


Fig 11. Vicious cycles of suffering

Pain leads to inability to cope with work or there is a loss of a job due to continued absenteeism, which in turn, can lead to financial and family distress, depression, a feeling of helplessness and suffering. Repeated treatment failures can increase a sense of hopelessness, suffering and both can increase pain perception. Long-term analgesics can lead to side effects. Pain itself can result in reduction of activity that in turn leads to physical deterioration, muscle wasting, suffering and pain. Patients are often de-conditioned, with excessive overt disability and typical pain behavior often reinforced by the family.

The goals of a pain management clinic are to reverse these vicious cycles, improve patient's function and ultimately his quality of life. Physician's team consists of specialists from different disciplines with a special interest in pain management. Not all of them are needed to consult on every case, but they are usually available for complex problems. Besides the physician, the multi-disciplinary team consists of a clinical psychologist, physiotherapist, occupational therapist, dietician, nurses and social workers.

There are many types of patients that are seen in such clinics. Some examples are those with chronic neck and shoulder pain, central pain from stroke, pain of spinal cord injury; patients with low back pain and failed back surgery syndrome; All types of neuropathic pain - the most common being brachial plexus injury. (Fig. 12, 13)



Fig 12. Patients with chronic persistent pain

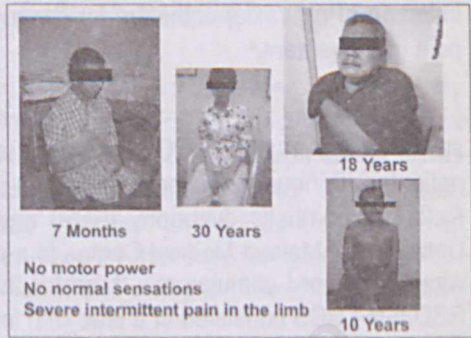


Fig 13. Brachial plexus avulsion injury

These unfortunate patients have been involved in motor-vehicle accidents, which have severed the brachial plexus from the spinal cord. The consequences are that of flail arm - with no power or any normal sensation, but severe neuropathic pain - burning pain or sharp, electric shock like pain in the arm- that can last for years.

A Multi-disciplinary approach consists of initial evaluation by the physician, psychologist, and physiotherapist to assess the degree of disability and evaluate the patient, his family and evaluate the extent of the factors affecting his perception of pain. A treatment plan is formulated, which is discussed with the patient. Education is an important aspect of pain management with proper explanation of cause of their pain. Patients need to be given a realistic prognosis with no false hopes. Goals are set and they are informed that 70% of the effort to relieve pain and disability lies within themselves and not the clinic.

Pharmacotherapy with appropriate drugs to relieve pain should be introduced but it should be emphasized that drugs form only one aspect of Pain Management. Physiotherapy to improve mobility and strength should be started as soon as possible. Sessions with a clinical psychologist are invaluable. Patients should be taught coping strategies and families instructed to reduce reinforcing behaviors. Cognitive behavioral therapy is an integral part of chronic pain management.

Interventional therapy like epidural steroid injections or peripheral nerve blocks may be needed, both as diagnostic or a therapeutic tool.³¹ This is particularly applicable in patients with complex regional pain syndromes or sympathetically maintained pain. Interventional therapy in the form of neurolytic blocks or the

insertion of neuraxial catheters for cancer pain management has a definite role in pain management.³²

Occasionally patients might require high-end techniques like the insertion of spinal cord stimulators (SCS). Although expensive, SCS are particularly useful in patients with neuropathic pain such as in complex regional pain syndrome _Type I - Reflex sympathetic dystrophy (RSD) and failed back surgery syndromes. At the University of Malaya Medical Centre, four patients have been successfully implanted with spinal cord stimulators - three for failed back surgery syndrome and one for RSD.^{33,34} A SCS consisted of a lead with four stimulating (electrodes) and is inserted into the epidural space at the appropriate level under local anaesthesia and under radiological guidance. (Fig 14)

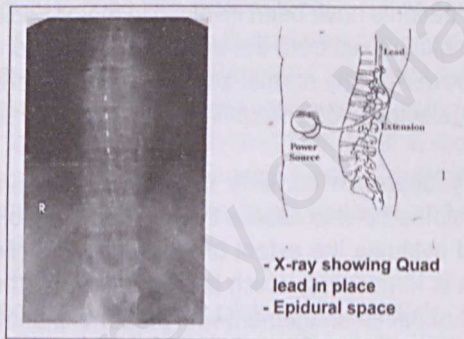


Fig 14. Spinal cord stimulator lead

After a trial of two weeks, a definitive lead is inserted and connected to a power source placed in a subcutaneous pocket in the anterior abdominal wall. The exact mechanism of action is unclear. However, neuropathic pain is reduced when the stimulator is switched on with a hand held activator and paraesthesia is felt at the site of pain.

In addition to all of the above, patients with chronic pain also require rehabilitation or may require occupational therapy for job re-training and need to be followed up on a long-term basis.

Management of Acute Pain - Postoperative pain relief.

Several surveys in the past have shown that acute postoperative pain was poorly controlled despite the availability of potent analgesics.³⁵ The main reasons cited were that postoperative pain management was not given much importance. It was usually left to junior staff, who were lacking in adequate training. Nurses were reluctant to administer potent opioids due to a fear of addiction. Ready et al published a landmark paper in 1988, which showed that organizing an Acute Pain Service in a hospital made a significant impact and vastly improved postoperative pain relief.³⁶

A survey in done in UHKL in 1991 showed that 47% of patients surveyed complained of severe pain following surgery, which was not relieved adequately.³⁷ It was an incentive to set up an Acute Pain Service (APS), which was established by the Department of Anaesthesiology in 1992. An Acute Pain Service is an organized way of providing pain relief using protocols and matching pain relief techniques between patient and surgery and monitoring them for adequacy of relief. An APS is an additional service that is undertaken by the Department of Anaesthesiology, hence hospital management approval must be obtained before it can be implemented. Its main components are Service to patients, Education for nurses and doctors, Quality Assurance and Research.

The APS team goes on regular ward rounds every day checking on patients and using pain assessment tools. Postoperative pain management techniques include patient controlled analgesia (PCA); epidural analgesia, subcutaneous analgesia and intrathecal morphine and patients are monitored by nurses in the wards. (Fig 15)



Fig 15A. APS - Team on daily rounds

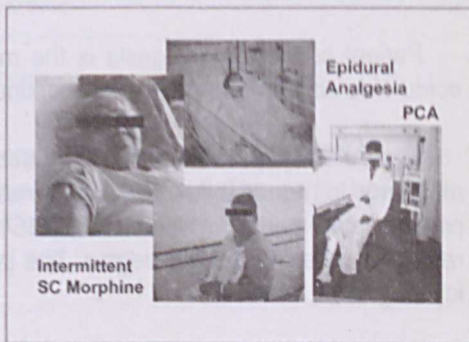


Fig. 15B. Different methods of postoperative pain management

The APS was started initially on two wards and, with increasing experience and confidence among the nurses, it was gradually extended to include patients in all surgical disciplines including paediatric patients. Continuing education on postoperative pain management is considered an important function of the service. It consists of tutorials for medical students in their fifth year of training, and regular workshops for nurses. These workshops are held two to three times a year to provide both didactic and practical hands-on training for ward nurses. The APS maintains a database of all patients who have been managed and this is important for quality assurance.

In the last 10 years (1992 - 2002), the APS has managed nearly 1000 patients a year - the majority of them are from the three main surgical disciplines - general, gynaecological and orthopaedic surgery. About 5% of patients include non-surgical cases such as acute trauma of fracture ribs and acute cancer pain.(Fig 16, 17)

Age (years)	45.7 ± 17.5 (1 - 99)
Weight (kg)	58.1 ± 13.5 (1 - 160)
Male : Female	3317 : 6641
Duration of surgery (hrs)	2.9 ± 1.4 (0.8 - 10)

9,958 patients

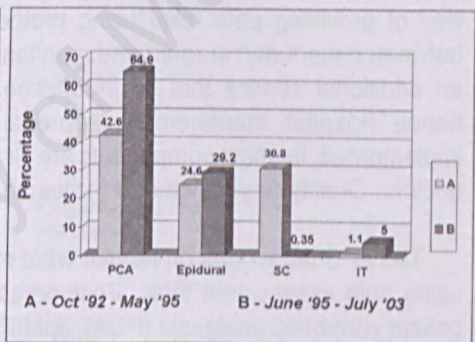


Fig 16. Patient Data - October '92 - July '03

Fig 17. Main Techniques Used

Patient controlled analgesia is the most widely used technique and when an epidural is inserted at surgery, it is continued for postoperative analgesia.

The APS keeps track of side effects and this allows the service to initiate measures to reduce them. The commonest side effect is nausea and vomiting in the postoperative period, which is about 15%, and this compares favourably with the results of other APS in the region. The incidence of respiratory depression is very low.(Fig 18)

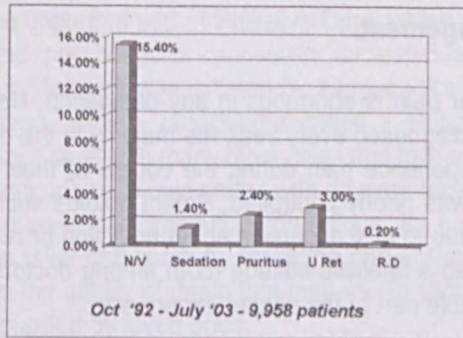


Fig 18. Incidence of Side Effects

All patients are asked to rate their level of satisfaction with their pain control when the APS withdraws from their management and satisfaction scores of either good or excellent is around 84%. (Fig 19)

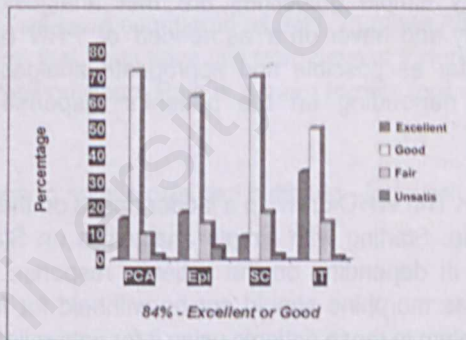


Fig 19. Satisfaction Scores

An organized service to manage postoperative pain has been shown to have benefits and is effective in a large number of patients.^{38, 39} The APS, however, continues to be challenged by some difficult categories of patients such as patients with severe burns, pain in infants / neonates and in the elderly.

Cancer Pain Management.

The burden of cancer pain is enormous in any population. Nearly 4.5 million new cases of cancer are diagnosed every year, the majority in the developing world and 70% of these will experience pain during the course of their illness. Up until the 1970s, cancer pain was poorly controlled. Potent opioids such as morphine were used only sparingly due to misconception about addiction or respiratory depression with it. There was also a fatalistic attitude (both among doctors and patients alike) that pain is an inevitable part of the cancer experience.

It is mainly due to the efforts of Dame Cicely Saunders working along with Dr Twycross at St Christopher's Hospice in London that the use of oral morphine has been established for cancer pain control. Dame Saunders is also responsible for the resurgence in the Hospice movement and palliative care.

The **WHO Guidelines** for cancer pain management was published in 1986⁴⁰ and is largely based on the pioneering work of Saunders and her colleagues in England. These very simple guidelines are that analgesic drugs should be administered regularly and never on a 'as needed' or 'PRN' basis. The oral route should be used as far as possible and appropriate analgesic drugs should be escalated upwards depending on the patient's response according to the ANALGESIC ladder.

Analgesic ladder. The WHO drew up a ladder based on the ready availability of analgesics world wide. Starting with simple analgesics on Step I and moving to potent ones at Step III depending on the patient's response. It emphasizes that potent opioids such as morphine should not be withheld for fear of addiction, as addiction is not a problem in those patients using it for pain relief. Physicians should go up the ladder depending on the patient's response to therapy. Drugs should be prescribed on a regular schedule, the oral route should be used as far as possible. Adjuvant drugs such as anti-emetics should be prescribed for other symptom control. Co-analgesics such as anti convulsants should be included if a patient is suspected to have neuropathic pain. These guidelines have been validated⁴¹ and have shown that pain can be controlled in 80% of cancer pain sufferers. The major barrier to more effective pain control is the lack of knowledge among medical and nursing staff and undue concerns about the dangers of addiction.⁴²

Pain Control is an important part of Palliative Care, which also consists of other symptom control and psychosocial counseling for patients and relatives. The Hospice Movement in Malaysia was initiated by a few dedicated individuals like Dr TJ Devaraj in Penang, with a programme called - Hospice at Home. Such programmes have since spread to many other cities and towns of Malaysia. Hospice Malaysia in Kuala Lumpur has its own centre with daycare facilities and patients and their relatives are counseled in tranquil surroundings. Its nurses visit patients at home to provide pain relief and comfort - for at the end of the day it is not only the quality of life but also the quality of death that matters. To allow a patient to die with dignity at home surrounded by loved ones.

Conclusion.

We have come a long way on our road to relieving pain and suffering. Some pain relief was available in the early days. Most of the understanding of pain mechanisms and improvements in pain therapy has come in the last 150 years - particularly over the last half-century. It has been a long journey from the days of opium as a sole anodyne to the modern management of pain. There are however miles to go before we can truly say that we have conquered all pain. To quote Albert Schweitzer again - "We must all die. But that I can save him from days of torture that is what I feel as my great and ever new privilege. Pain is a more terrible lord of mankind than even death itself.

It is really our privilege to relieve pain and suffering - for surely "Pain relief is a basic human right"

References:

1. Schweitzer A. *On the edge of the primeval forest*. New York: Macmillan, 1931: 62
2. Castiglioni A. *A History of Medicine*. New York: Knopf, 1947
3. Tainter ML. Pain. *Ann NY Acad Sci* 1948; 51: 3-11
4. Plato. *Timaeus*. Edited with introduction and notes by RD Archer-Hind. London: Macmillan 1888
5. *Hippocratis medicourm omnium facile principis opera onmia quae estant*. Geneva: Chouet, 1657
6. Galen C. *De usu partium*. Translated by M Tallmadge. Ithaca, NY: Cornell University Press, 1968
7. Veith I. *Huang Ti Nei Ching Su Wen*. Baltimore: Williams & Wilkins, 1949: 227
8. Homer. *Odyssey*. Translated by GH Palmer. Cambridge: Houghton-Mifflin, 1929
9. Kane K, Taub A. A history of local electrical analgesia. *Pain* 1975; 1: 125-138
10. Avicenna. *The canon of medicine*. Translated by OC Gruner. London: Luzae, 1930
11. Macht DI. The history of opium and some of its preparations and alkaloids. *JAMA* 1959; 64: 477-481
12. Procacci P, Maresca M. The pain concept in western civilization: a historical review. In: Benedetti C, Chapman CR, Moricca G, eds. *Advances in the management of pain. Advances in pain research and therapy*. Vol 7. New York: Raven, 1984
13. Descartes R. *L'Homme*. Paris: e. Angot, 1644

14. Bell J, Bell C. *The anatomy and physiology of the human body*. 5th Am ed. New York: Collins, 1827
15. Magendie F. Experiences sur les fonctions des racines des nerfs rachidiens. *J Physiol Exp* 1822; 2: 276-279
16. Muller J. *Handbuch der physiologie des menschen*. Vol 2. Translated by W Baly. London: Raylor 7 Walton, 1839-1942: 249-250
17. Schiff JM. *Lehrbuch der physiologie des menschen I: Muskel and nervenphysiologie*. Lehr: M Schauenburg, 1858: 234, 253-255
18. vonFrey M. Ber. Verhandl. Konig.sachs. Ges. Wiss. Leipzig. Beitrage zur Physiologie de Schmerzsinnes 1894; 46: 185, 188
19. Erb WH. Krankheiten der peripherischen Cerebrospinalen Nerven. *Am J Phychol* 1895; 7: 109
20. Goldscheider A. Ueber die summation von hautreizen. *Arch Physiol* 1891; 164 - 169
21. Strong CA. The psychology of pain. *Pschol Rev* 1895; 2: 329-347
22. Sherrington CS. Cutaneous sensations. In: Schafer EA, ed. *Textbook of physiology*. Vol 2. Edinburgh: Pentland, 1900; 920-1001
23. Melzack R, Wall PD. Pain mechanisms: a new theory. *Science* 1965; 150: 971-979
24. Pert CB, Synder SH. Opiate receptor: demonstration in nervous tissue. *Science* 1973; 179: 1947-53
25. Merskey H, Spear FG. Pain: psychologic and psychiatric aspects. London: Balliere, Tindall and Cassell, 1967
26. Pilowsky I. Abnormal illness behaviour and sociocultural aspects of pain. In: KesterlitzHW, Terenius LY, eds. *Pain and Society*. Weinheim: Verlag Chemie, 1980: 445-460

27. Beecher HK: Pain in men wounded in battle. *Ann Surg* 1946; 123: 96-105
28. Bonica JJ. Evolution of multidisciplinary / interdisciplinary pain program. In Aronoff GM, editor: *Pain Centres: A Revolution in Health Care*. New York, Raven Press, 1988
29. Alexander FAD. *The control of pain*. In Hale DE, editor: *Anaesthesiology*, Philadelphia. FA Davis, 1954
30. Sternbach RA. Chronic pain as a disease entity. *Triangle* 1981; 20: 27-32
31. Vijayan R, Low KH. Pain relief with Intravenous Regional Guanethedine in Post traumatic reflex sympathetic dystrophy. *Med J Malaysia* 1993; 33 (4): 424-426
32. Cousin M, Gourlay G, Cherry D. A technique for the insertion of an implantable portal system for the long-term epidural administration of opioids for cancer pain. *Anaesth Int Care* 1985; 13: 145-152
33. Vijayan R, Ahmad TS. Late postdural puncture headache following implantation of a lumbar spinal cord stimulator. *Pain Digest* 1997; 7: 349-50
34. Vijayan R, Ahmad TS. Spinal cord stimulator for treatment of failed back surgery syndrome. Two case reports. *Med J Malaysia* 1999; 52:
35. Marks RM, Sachar EJ. Undertreatment of medical inpatients with narcotic analgesics. *Ann Intern Med* 1973; 78: 172-181
36. Ready LB, Oden R, Chadwick HS et al. Development of an acute pain service in a major teaching hospital. *Anesthesiology* 1988; 68: 100-106
37. Vijayan R, Tay KH, Tan LB, Loganathan.S. Survey of postoperative pain in University Hospital, Kuala Lumpur. *Sing Med J* 1994; 35: 502-4
38. Vijayan R, Delilkan AE. First year's experience with an Acute Pain service - University Hospital Kuala Lumpur. *Med J Malaysia* 1994; 49: 385-400
39. Wheatley RG, Madej TH, Jackson IJB, Hunter D. The first year's experience of an acute pain service. *Br J Anaesth* 1991; 67: 353-359

40. World Health Organization: *Cancer pain relief*. Geneva, WHO, 1986
41. Ventafridda V et al. A validation study of WHO method for cancer pain relief. *Cancer* 1987; 59: 850-56
42. Takeda F: Preliminary results of field testing in Japan of the WHO draft interim guidelines for relief of cancer pain. Geneva, WHO, 1989

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