

# NURSING PRESENTATIONS

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## The Management of Pain in a Military Operational Environment By Colonel Beverley Wright

### Introduction

The management of pain is an issue that has been debated for years for those of us who work in the area of health care. In an operational military setting the provision of health care to the sick and injured comes with its own set of circumstances. This paper will outline the complexities of pain management in a military environment, the difficulties of delivery due to limited or scant resources, the required modalities, geography, climate and the environment, which is most often austere. Overlaid on this is the cultural diversity of those to whom care is provided. The delivery of care will often be to those from a disrupted country following conflict, natural disasters, terrorist attacks and the like. The comfortable surrounds of the civilian health care sector, is nowhere to be seen. This is the context in which deployed Australian Defence Force (ADF) health care personnel work. I will therefore commence my presentation looking firstly at the history of the management of pain. This will be followed by a short discussion on pain relief, which is an essential component of combat casualty care. For the injured soldier, analgesia is not only a matter of comfort. The alleviation of pain may allow the soldier to remain quiet when noise discipline is at a premium.

### Historical Perspective of Pain

Pain is a complex problem. It is the oldest and most universal medical problem. It has been an affliction of mankind forever, yet it has been little understood in physiology until more recent times. Pain is the central metaphor of Judeo-Christian thought. The philosophical, political and religious meanings of pain is defined, the suffering of individuals for much of human history. <sup>(1)</sup>

Historically we know that the early European physicians did what they thought appropriate at the time to relieve their patients' pain. Opium was the choice of drug at that time, after 1680 Laudanum, which was a mixture of opium in sherry, was introduced by Thomas Sydenham. This was used when necessary to relieve the evil humours or to amputate diseased limbs <sup>(2)</sup>. In fact physicians valued pain as a symptom, a sign of the patient's vitality and of the prescription's effectiveness. In 1826 <sup>(3)</sup> comment was made that "the greater the pain, the greater must be our confidence in the power and energy of life." The belief was

that while all people endure physical suffering, and that it is inevitable, the meaning, rather than the fact of pain, was what mattered to having a good life.

The early 1800s began a gradual change in the management of pain, this was the era of the utilitarian philosophy. The emphasis was on reducing the pain of the greatest number, combined with the new philosophy of individual rights and the Romantic poets' insistence on the importance of individual experiences. <sup>(4)</sup> It was now seen as positive to relieve pain.

History is rich in evidence of the many and varied attempts of anaesthesia and analgesics. The introduction of surgical anaesthesia was indeed one of the greatest revolutions of modern medicine however, all physicians were not readily enthused over this discovery. The literature highlights several possible reasons for this. Firstly, the skilled surgeon took pride in his ability to operate rapidly so minimising his patient's agony. There was also extended debate in both Europe and the United States over whether operating under anaesthesia might actually retard the healing process. Religious writers of the time labelled anaesthesia as a violation of God's law, whom they believed inflicted pain to strengthen faith and to teach new mothers the need of self-sacrifice for her children <sup>(6)</sup> Surgeons however, could not resist their new power to perform longer and more complex procedures and most patients thought anaesthesia a divine blessing.

Nevertheless for most of the 19th Century, the use of anaesthetics was not universal. Physicians used a 'calculus' to determine which patients were of the correct sensibility to need or benefit from the use of anaesthesia <sup>(7,8)</sup>. Over time however, the story of anaesthesia illustrates the complexity of pain as a phenomenon and the way in which its cultural meanings have often complicated its treatment <sup>(9)</sup>. It was finally accepted that the use of anaesthesia to relieve pain was indeed a good outcome albeit secondary to curative therapy. By the mid 1800's, pain had become the topic of three interrelated medical discourses that have continued to the present day. The symptomatic relief of acute pain and the palliation of severe pain, in those suffering and dying from progressive diseases, such as cancer, and chronic pain from a number of disorders including tension and migraine headache; osteoarthritis; rheumatoid arthritis; diabetic neuralgia; trigeminal neuralgia; recurrent lower back pain, abdominal, and pelvic pain; and causalgiform disorders (reflex sympathetic dystrophies). <sup>(10)</sup>

## Opiates Throughout the 19<sup>th</sup> Century

Following is a potted history of the use of opiates throughout the 19<sup>th</sup> Century. Opiates were the drug of choice during this era for the treatment of acute pain from injuries and for recurrent pain such as headache and toothache. There were notable advances during this time such as the industrial production of morphine in Germany in the 1820s and in the United States a decade later. In 1855 Alexander Wood devised a syringe with a hollow needle for subcutaneous injection, which was of immediate benefit. Literature states the syringe made

frequent administration of drugs so convenient that this possibly lead to the overuse of morphine <sup>(11)</sup>. The growth in opium and alcohol -based compounds, which came in the form of liquids, pills and "headache powders" were unregulated and freely available over the counter in America and many people self medicated. By the 1870s physicians had begun to express concerns about "the morphia habit" and its "repeated indulgence inducing bodily and mental perversions" <sup>(12)</sup>. In 1898 the Bayer Company of Germany introduced diacetylated morphine under the trade name Heron as a cough remedy. Early reports claimed that this new product had a less habit-forming potential than morphine. By 1910, young working class Americans had learnt to crush the pills into a powder and inhale it to achieve a more concentrated high. The United States introduced the Harrison Narcotic Control Act in 1914 in an effort to stem the increase in morphine addiction <sup>(13)</sup>. Bayer in 1899 introduced aspirin, which was proven to be safe, was well tolerated by patients and highly effective as an analgesic and antipyretic. This became an over- the - counter drug and effectively supplanted opiates for the treatment of mild to moderate pain. <sup>(14,15)</sup> There was much discussion during this time about the use of opiates for the treatment of severe cancer pain, and evidence to support that a number of physicians advocated the vigorous use of analgesics in seriously ill and dying patients. There was often conflict between the physician's desire to relieve the patient's pain and the fear of inducing addiction. This school of thought persisted in medicine throughout the 20<sup>th</sup> Century. Physicians and patients equated morphine use with a loss of autonomy that the strong should resist at all costs. <sup>(16)</sup>.

## The Ordeal of Chronic Intractable Pain

Patients with chronic "pain without lesion" confronted a different, but equally agonising ordeal. The 19<sup>th</sup> Century physicians did not ignore the pains, which persisted in the absence of evident pathology and also often failed to respond to treatment of opiates <sup>(17)</sup>. In fact S. Weir Mitchell, the American neurologist who wrote classic descriptions of pain syndromes, such as phantom limb pain and causalgia based on his Civil War observations, strongly asserted the reality of his patients' physical illness, despite their unexplained pain and odd behaviour. On the subject of causalgia, a burning pain in an extremity that persisted after an injury has healed, he wrote that it was "the most terrible of all the tortures that a nerve wound may inflict. Under such torments, the most amiable grow irritable, the soldier becomes a coward, and the strongest man is scarcely less nervous than the most hysterical girl" <sup>(18)</sup>. These patients reported pain at the slightest touch, and a range of treatments were offered inclusive of ammonia blisters, electricity and morphine with varying degrees of success. Many of the men were still suffering pain some 30 years later <sup>(19)</sup>.

During this period there was a growth in neurologists who developed specific diagnostic tests and identification of meaningful signs. In the late 1800s they began to eliminate unexplained chronic pains from their professional purview, while alienists and psychoanalysts found these disorders useful clues to mental or emotional disease. <sup>(20)</sup> The Specific theory was the standard model taught in

medical schools at the time and few clinicians between the first and second world wars found this theory too limiting nor did they find available therapeutic options inadequate. With this came the view that those who suffered from unexplained chronic pain syndromes were deluded or they were condemned as malingerers or drug abusers. However, there were new initiatives on the horizon. A number of neurosurgeons had adapted the method developed by the French surgeon Rene Leriche in WW1 who treated many patients with nerve injury. He had proposed the careful resection of the arteries near the injury, followed by a large injection of procaine to block all sensation. Only if the procaine failed to produce substantial relief did he advocate ligation of the periarterial sympathetic nerve fibres or of the sympathetic ganglia supplying the limb. Regional nerve blocks had been available before 1900 and advances during this period continued <sup>(21)</sup>.

### Wartime Generates New Ideas

War traditionally revolutionises the way health care is delivered. One example was the introduction of delayed primary wound closure, which to this day has saved the lives of many on the battlefield. So it was for the management of pain. WW1 provided a unique opportunity for clinicians to observe and work with complicated injuries and hence became a watershed in the management of pain. From here research-based pain clinics were established. Double-blinded crossover trials and simple numerical scales to quantify patient reporting were instituted <sup>(22,23)</sup>. In 1953 Bonica wrote the book *The Management of Pain* <sup>(24)</sup> which gathered together all information available about the etiology, diagnosis, and treatment of human pain <sup>(25)</sup>. He also promoted the use of nerve blocks. Eventually the use of serial anaesthetic blocks allowed the management of many difficult pain problems without having to resort to surgery <sup>(26,27,28)</sup>. Pain started to be seen as a multidisciplinary problem. In the United Kingdom Cicely Saunders, a medical practitioner, who had dedicated her life to care of dying, was planning a model of hospice care that would provide exemplary palliative care, and would incorporate teaching and research programs. <sup>(29,30)</sup> She advocated the regular use of strong narcotics, including heroin and the Brompton cocktail mixture of morphine and gin, as the proper regimen to ensure that a patient could remain pain-free and maintain quality of life in the last days <sup>(31)</sup>.



### Formation of the Pain Field

Before moving on from the historical section of this presentation it is worth mentioning the Gate Theory. Whilst I will not go into the mechanism of gate control suffice to say that work undertaken with this concept helped to breakdown disciplinary barriers and offered a plan for 'the construction of a

world of pain." The interest in the gate model, both supportive and antagonistic drew attention to pain as a problem.

## The Provision of Pain Relief on Operations

The increasing operational tempo for the ADF continues to escalate. Since the late 1980s ADF operations has seen its health personnel involved in deployed operations around the world. These operations have included, Gulf Wars one and two, Somalia, Cambodia, Rwanda, PNG, Bougainville, East Timor, Solomon Islands, Neui, Afgaistan, Iraq and Kurdistan. They have also been aboard the naval ships that were required to deflect unlawful boat arrivals from reaching Australian shores. Wherever, the ADF deploys to so do ADF health care personnel. Each deployment has a unique set of circumstances. However, the one constant is that the patients who come through the door will require care. Be these Australian troops, troops from other nations, the local population, VIPs, or members of NGO's . For many, particularly those whose country is at war, and who have been spared from the genocide, or those that have been devastated by a natural disaster, such health care will not be available in their own country particularly at this time and may well never have been.

When Defence Health Services personnel deploy they may be required to provide Level one through to Level three health care. Simply put from buddy aid to initial resuscitation and stabilisation, to a surgical facility. The amount of equipment and range of therapies available influence the provision of care at these levels. For example systemic medications remain the drugs of choice for pain management in the special operations and conventional combat environment. However, regional anaesthesia also plays a role in the field. Advantages of regional anaesthesia in the field include analgesia, with no change in mental status, no nausea, and potential improvement in ventilatory mechanics<sup>(32)</sup> It is worth remembering the type of analgesia given to the injured soldier will depend on the severity of the casualty's pain. A survey undertaken in WW11 showed that many men appeared undisturbed by seemingly horrific wounds sustained in battle, though the same wounds in a civilian setting would have be expected to produce agonising pain<sup>(33)</sup>. Therefore, it is logical to assume that if wounds are not significantly painful, no analgesia is indicated. However, if a casualty is suffering from mild to moderate pain, small doses of analgesia may be given. If a casualty's wounds are more severe such as bony injuries and burns they may require more potent analgesia. In these cases pain management can be achieved with morphine, via the IV route which allows for the much more rapid onset and more accurate titration of narcotic dose than the IM route. An initial dose of 5 mgs is given and repeated at 10-minute intervals until adequate analgesia is achieved. It is important to remember that individuals who have received high doses of morphine may become nauseated and begin to vomit hence an antiemetic should also be given to prevent this side effect.

It is important to also note the context in which the provision of care will be provided. Wars and other operations occur in all locations around the world and

in all possible conditions. The relief of pain is an essential ingredient of combat casualty care. Soldiers are often exposed to extremes of weather, suffer from prolonged exposure to the elements, be dehydrated and perhaps confused from working in an environment, which precludes the use of light. Further, continuous operations can run 72 hours or longer, with no opportunity to sleep. The terrain in which the operations are conducted may be mountainous, bitterly cold, or very hot. Also increased altitude and the need for acclimatisation will all have an effect on the deployed soldier <sup>(34)</sup>. The soldier who requires care in an operational setting will be assessed as having a negative fluid balance of some 2 litres to start. This is before any other the impact of any other injury, and is directly related to the environment in which the soldier is required to work. Keeping this in mind not all types of pain relief will be appropriate. For example tramadol is not a drug of choice for pain management for the injured soldier, as the patient should be well hydrated to prevent the risk of kidney failure. The management of pain can therefore become quite challenging at times. To help demonstrate this I will provide you with a few different scenarios to show you the width and depth of the management of pain on operations. The examples will look at the management of both military and civilian casualties.

## Rwanda

In 1994-1995 ADF health personnel deployed to Rwanda following the genocide of 500,000 to 1 million people. The types of patients that required care ranged from mine injuries, Gun vehicle accidents, and a range of disease Australia. A Level three deployed which included through to surgery and hospital was set up in Rwanda. The types of patients who were admitted to this facility mirrored mostly that of a large civilian hospital in Australia. The management of these cases was similar to civilian practice. In the resuscitation area patients were given the schedule of drugs necessary to provide cover for infection and the pain relief that was administered depended on the patients condition. For severe trauma such as a GSW, mine injury, MVA and machete wounds IV morphine was administered and pain relief was a priority in the management of these trauma patients. In all patient care areas communication with the patient was often a problem as many did not speak English and few of the Australian health personnel spoke Kenyan, Swahili or French so trying to ascertain pain levels was very difficult at times. In the intensive care unit it would have been advantageous to have a PCA so that the patient could have administered his or her own narcotic. The use of suppositories was not very successful as different cultures have different attitudes to the insertion of foreign object into cavities.



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Another important consideration in pain management is culture, as this can influence a person's perception of pain. In Rwanda there was a need to develop an increased sensitivity to the influence of their culture on health care beliefs and practices. To more effectively manage pain, health staff needed to conduct culturally sensitive pain assessments that would elicit information concerning beliefs about the pain experience from both the patient and their family. This dilemma has been replicated in each country we have the opportunity to be involved in.

## The Bali Bombing

The Bali bombing occurred on 12 October 2002, ADF health personnel were promptly deployed to Bali to assist. Some were located at the Denpasar Airport where casualties poured in. The patients were mostly young, quiet and stoical. There were no complaints or unreasonable demands. On the contrary, most were concerned for their mates <sup>(35)</sup>. Other health personnel were sent to the



Sanglah Hospital where they saw a facility which was completely overwhelmed with injured Australians who were suffering with severe burns, blast and shrapnel wounds. Amongst the chaos there were two critical patients. One was a man with 80% - 90% burns who was being ventilated by an Australian paramedic from

Darwin on holiday; the other had extensive burns and had had a laparotomy for shrapnel wounds to the abdomen. Over the next 21 hours 66 patients were evacuated to Australia. This terrorist attack had caused large numbers of critically injured Australians in a country where the provision of medical services differs significantly from their own. This provided unprecedented challenges. Burns required prompt resuscitation and expert surgical management and to achieve this victims were sent to specialist burns units around Australia.

The AME of such patients was challenging, as there were such large numbers of critically injured patients. The management of these patients involved oxygen therapy, IV fluids, blood products, drugs and critical care equipment. Morphine was used to relieve pain along with ketamine, midazolam, muscle relaxants, antibiotics and Tet Tox <sup>(36)</sup>.

Those patients who were transferred to the Royal Darwin Hospital had their sutured blast wounds laid open owing to overt infection. Delayed primary closure is still the surgical procedure of choice in an operational environment as it was in WW2. The management of these patients included airway management,

breathing management, circulation, temperature regulation, wound management, tetanus prophylaxis, and psychological support and pain relief. The pain relief provided to the patients was morphine and was used in large quantities as the patients were in extreme levels of pain.<sup>(37)</sup> IV flasks were made up of pethidine/saline and these were infused, titrated against pain, with staff splitting the limited ampoules of pethidine and tramadol between them and administering and charting them according to pain levels. The authors of the article Australian Doctors in Bali: the initial response to the Bali bombing<sup>(38)</sup> says "one of us well remembers an Australian man whose face was totally burnt, who could hardly open his eyes and, like many, could not hear well because of blast injury deafness. When offered pain relief he said. "No thank you doc, but go and see someone who needs it more than me." This is just another example of how culture influences pain. Unfortunately this man returned to Australia and did not survive.

## 28<sup>th</sup> Combat Support Hospital in Iraq

The 28<sup>th</sup> Combat Support Hospital is a US Military Hospital in Baghdad, which arrived in location in August 2003. Some of the conditions the military patients presented with included a large variety of acute cases, such as kidney stones, dehydration, fractures, lacerations, skin lesions, testicular masses/pain, musculoskeletal sprains, URI, anxiety, acute abdominal pain, menstrual irregularities, UTI, and pregnancy detection and treatment. Some of the chronic problems included thyroid disease, depression, high blood pressure, migraines, hyperlipidemia, arthritic diseases, overweight concerns, diabetes and chronic pain syndromes. Many of the 28<sup>th</sup> Combat Support Hospitals patients had had a long history of chronic pain, mostly orthopaedic problems. The majority of these being low back pain as well as chronic knee and shoulder pain, or non-surgical. They also had a number of females presenting with chronic pelvic pain. Most had had extensive workups in the past without a diagnosis being formed. There were male presentations with chronic groin/testicular pain, again without formal diagnosis<sup>(39)</sup>. As we all know, working with chronic pain is difficult, but the context in which the management of pain is being offered, limited specialists, almost no access to more definitive testing such as MRIs, is very frustrating.

The approach in this situation was to try different medications in conjunction with activity limitation<sup>(40)</sup>. At this facility they were using Nonsteroidal Anti-inflammatory Agents (NSAID) as well as COX2's. They also added Elavil (tricyclic) at night<sup>(39)</sup>. There were some successes with Neurontin in-patients with radiculopathy symptoms. For the treatment of back pain, steroid injections into the lumbar region were also offered. Such treatments were also accompanied by limitations to physical activity such as no running, no sit-ups or pushups.



Another implementation was in the reduction in their duty time so that they would not be carrying extra weight for extended periods. LTCOL Theresa Horne who was the APN in the US Nurse Corps provided me with this information and stated that " chronic pain is a huge problem here (Iraq). A lot of our soldiers here are National Guard and Reservists- they only play Army on weekends for many years. They are not used to the job requirements. Many are reserve truck drivers who never drove a truck during their training in the US, now they are driving huge tractor trailers, in all of their gear, on horrible roads, for days on end <sup>(41)</sup>." Those who can no longer function in this environment are sent home. She concludes with "I wish we had more capability to deal with chronic pain" but being one of the first US hospitals over in Iraq they had limited physiotherapy equipment, no ultrasound, or Medical Officers who specialise in the management of chronic pain. She was hoping that their replacement staff would be able to rectify this problem.

## Conclusion

The management of pain is indeed complex with every patient experiencing pain in an individual way. Further more, different kinds of pain may cause a variety of pain- related problems. From the scenarios provided, the management of pain from a military perspective may be to Defence Force members, and civilian populations with a variety of pain management treatments offered. ADF health care personnel may find themselves in a variety of interesting places throughout the world. They are required to understand the culture of patient they will be treating, and must develop strategies to provide effective pain management. The complexities of pain management in an operational environment can be challenging. The level of pain relief will depend on the type of injury and the situation at the time. The aim is to always provide the best available pain relief, irrespective of the location and circumstances.