

CHRONIC PAIN & ITS MANAGEMENT

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The size of the problem

Pain. Such a little word, and yet if you suffer from chronic pain, it can rule your world. It can dictate whether you get out of bed today, or struggle into work, if you are strong enough to pick up your child for a hug or vacuum the carpet. If you don't personally suffer from chronic pain, probably you have not the faintest conception of this ravaging beast that eats your energy, destroys our relationships, darkens your life ó sometimes to the point where you wonder whether there really is much point going on.

Chronic pain is easy to understand in principle, but it can be very hard to grasp the true size of the problem, for these two words represent one of the great scourges of the Western world. Chronic pain affects one in five people: it is a major problem for individuals, businesses and governments. It causes immense physical, emotional, psychological and financial hardship.

These two words can sound the death knell to someone who has spent months or years being passed from doctor to specialist and back again, desperately seeking help for a condition that no one can properly explain. For too long, chronic pain has been dismissed as incurable, untreatable or even all in the mind. That might once have been the case, but it is no longer true. These days, there are many things that make chronic

pain bearable, treatments of all kinds that can help sufferers to take back control of their lives, and that is the point of our website. It is all about chronic pain: what it is, what causes it, and what can be done about it.

One of the first things you need to understand is that you are not alone. The International Association for the Study of Pain has found that chronic pain afflicts twenty per cent of the adult population in developed countries, more often women and the elderly. There are many causes, but one in three people will have musculoskeletal and joint disorders or neck and back pain. One in ten will be laid low by persistent headache and migraine.

Although eighty per cent the 67 million patients dying of cancer annually will suffer from pain, only two per cent of those will suffer from *chronic* pain. There is a difference.

What is pain?

There is a lot more to pain than just *ouch!* The Oxford English Dictionary describes pain as ‘a strongly unpleasant bodily sensation such as is produced by illness, injury, or other harmful physical contact, etc.; the condition of hurting’ The International Association for the Study of Pain uses similar words: ‘an unpleasant sensory or emotional experience associated with actual or potential tissue damage, or described in terms of such damage’¹

So pain is an unpleasant sensation: everyone can agree on that. It is often accompanied by emotional problems such as anxiety, depression or insomnia, the inability to sleep. Pain is caused by an event which has damaged the body, such as an injury, or which has the potential to damage the body if it is ignored. Often people use descriptions that they can only imagine: few people who say, ‘It’s a stabbing pain’

will have actually been stabbed; -walking on broken glass is a term most will never have had the pleasure experiencing in real life.

Pain, however you describe it, is the body's natural response mechanism to actual physical harm, or to possible damage to the body's tissue or organs. It may not be pleasant, but it can be life-saving. Appendicitis is a good example of how this defence mechanism works. You get a sudden, severe pain in the abdomen and call the doctor. The doctor recognises the possibility of acute appendicitis, so you are referred immediately to the hospital, where surgeons save your life. If the sharp pain had not alerted you, the appendix might well have burst, flooding the abdominal cavity with faecal matter, causing peritonitis and killing you.

This is called *acute pain*, and it not only very useful, but vitally necessary. The appearance of acute pain alerts the body that something is wrong, so the source of pain can be removed and additional damage prevented. It may hurt, but without the ability to feel acute pain, you could very well die.

There are a number of conditions which make the body insensitive to pain, and they can have serious consequences. Diabetics can develop *diabetic neuropathy*, when the feet, sometimes even the legs, become numb and insensitive to pain. As a result of this, trivial problems can go unnoticed. An in-growing toenail is normally very painful, but if you can't feel it, you might not notice it and if it is left untreated, it can become infected and develop gangrene, which in turn can lead to blood poisoning and death.

Leprosy causes damaged nerves and many of the conditions that cripple or kill leprosy sufferers are as a result of not feeling injuries: the first and most important guard against infection is acute pain. Sometimes, thankfully rarely, people are born

with the total inability to feel pain (*congenital insensitivity to pain*), and as with leprosy and diabetic neuropathy, this can lead to them severely harming themselves.

Acute pain, while deeply unpleasant, is vitally necessary to our survival. When it is no longer needed, acute pain goes away. It stops hurting. Before very long, you can scarcely remember the agony of a broken arm or a burn.

However, the continual pain generated by arthritis serves no useful function except to demoralise the sufferer, put a strain on the family and a burden on the nation's health resources. This is *chronic pain*, it doesn't go away and it has no use at all. In this case what you want to do is tell your body: "Yes, I know that things are not quite right, but I'm not going to die from this so can you please switch it off?" And that's where the trouble starts. When pain persists long after its value as an alarm signal has passed, all it does is show that changes have occurred within the body tissues. In some cases, the damaged tissue may have actually healed, yet still you hurt.

This is chronic pain, and it is no longer a symptom: it has now become a disease in its own right, and one which demands treatment. If you are reading this you will know well that even that is not as simple as it might sound. Chronic pain is bad enough, but it can also trigger psychological problems, including depression and anxiety, producing a most unpleasant state of affairs for both the sufferer and for family and friends. It is not just the pain that needs to be dealt with, but all the other unpleasant effects that the pain has generated.

It is now generally accepted that persistent (chronic) pain and the many physical and psychosocial changes and complications associated with it constitute a major health care problem. Chronic pain is a specific health care problem and a

disease in its own right, and it should only be diagnosed when all signs of the original cause have disappeared, or where there is no cure for the initial condition.

This website is all about chronic pain, which, for practical purposes, most doctors call when it has been present for at least three to six months. And here's the next problem. Pain, especially chronic pain, is very much a personal experience. The same condition may cause quite different types of pain in different individuals and what's more, what one person considers severe pain may be quite moderate to another. Pain is a subjective and highly individual experience, and that means that it is virtually impossible to prove it, or to measure it objectively.

Pain is not just an unpleasant sensation it is also an emotional experience (*suffering*), which often generates altered behaviour. How someone feels pain is influenced by psychological, emotional and cultural factors and even their own personality. In 1944 Dr Harry K. Beecher, the medical officer at the Anzio beachhead in Italy charged with admitting casualties to the military hospital, asked every man, "Are you in pain? Do you need something for it?" All the men were severely wounded, but some seventy per cent of them answered no to both questions. Beecher went on to become Professor of Anaesthesia at Harvard where he was a leader in clinical pain studies; some years later he asked the same questions of a group of men of the same age with similarly painful injuries. In this case, some seventy per cent answered yes to both questions. So it can depend on where you are, what happened, and what sort of a person you are: some people can cope relatively well with severe pain, but others just go to pieces. One Canadian study showed that women had a higher pain level when it came to heat, while men deal better with electrical shocks.

Measuring pain

The Visual Analogue Scale (VAS) is a very simple way of quantifying or measuring pain. Imagine or draw a line 10 cm long. At one end is 0, no pain, at the other end 10 represents the most horrible pain imaginable. The number selected gives some indication of the pain level, but this is very limited, for it only measures one dimension of pain without taking anything else, such as the emotional trauma inflicted by the pain, into account.

Pain clinics use a variety of questionnaires in their bid to more accurately log the whole of the unpleasant experience that is pain. The McGill Pain Questionnaire is most often used: it combines a number of different techniques, including the VAS, to evaluate the type and scale of pain. The sufferer is asked to choose words to describe the way the pain feels, physically and emotionally – burning, sharp, stabbing, dull, sickening, crushing – and to select numbers on a scale to show how the pain affects him or her. Sometimes the quality of the pain can give the doctor a clue to the cause – heart pain is often crushing; nerve pain is often burning and/or stabbing.

Quite apart from the difficulty of putting a value on pain, it does not always appear at the spot where the problem is. There are a number of cases where pain in one part of the body may indicate a problem at another site: this is called *referred pain*. Severe pain down a leg (sciatica) may be caused by a slipped disk in the back; a hip problem may cause knee pain, and gall bladder pain may be felt in the right shoulder.

Types of Pain

There are three categories of pain, namely

Nociceptive pain,

Neuropathic pain

Functional (or Psychological)

[a] **Nociceptive** (*no-see-septive*) **pain** is essentially pain caused by damage to body tissues in the presence of a totally normal nervous system.

The term is derived from the word *nociceptor*.

Pain receptors are called Nociceptors; they sense injury and respond by transmitting pain sensations from the parts of the body, which suffer damage.

Damage can be to the body framework (especially the bones, joints and muscles) such as happens in arthritis where chronic inflammation produces pain or it can be to damage to the body organs such as the pancreas or kidney.

Nociceptive pain can be a temporary condition e.g. a sprained ankle or a stiff neck.

Such forms of nociceptive pain are short-lived and easily treated with rest or medications.

In its acute form, this kind of pain is a signal that the body is being damaged in some way that needs immediate attention.

In certain conditions, nociceptor sensitisation sets in (*see below*) and nociceptive pain can then become a chronic condition.

Nociceptive pain tends to be very receptive to morphine-type drugs.

[b] **Neuropathic** (*new-row-path-ic*) **pain** is pain, which is triggered by damage to a part or to parts of the nervous system .

Nerves can be invaded or squeezed by tumours, trapped by scar tissue, inflamed by infection or damaged by toxic chemicals or by deranged metabolism.

Neuropathic pain frequently has a burning, and/or sharp ‘electric shock’ qualities.

Neuropathic pain refers to pain, which is not associated with the triggering of specific pain receptors, but which is due more to a sensitisation of the nervous system.

The damaged nerve(s) and sometimes even nearby undamaged nerves become oversensitive and can then be ‘set off’ by various stimuli, sometimes as innocuous as light touch.

Continual bombardment of the spinal cord by repeated barrages of nerve impulses coming from these affected nerves can make the spinal cord very sensitive so that it starts to magnify the intensity of the pain impulses it transmits to the brain (*windup*-see below).

It is important to remember that even if the damage, which triggered off the nerve problem in the first place has healed, the nerve(s) may remain in this hyperexcitable state.

In neuropathic pain, therefore, the pain is being caused by the damaged nerve and not by the original injury.

According to Dr. Alan Basbaum (a leading American Pain specialist), *“The nervous system after injury, with respect to the processing of pain, is a very different nervous system to that which existed before it was injured”*.

Perhaps the most common example of neuropathic pain is the pain, which can persist for many years after an attack of shingles. This pain, referred to as *post herpetic neuralgia* can often prove to be a severe challenge to both the patient and his/her doctor.

[c] **Functional (Psychological) pain** happens due to alterations in the normal function of the nervous system as a result of non-organic (psychological) causes.

On the whole, most people can handle physical pain more than they can handle psychological pain.

For example a man under severe emotional pressure for whatever reason may be unable to burst to burst into tears; he may, however readily convert his stress into pain

and project this pain to a part of his body e.g. his back by a process called *somatisation*.

A person who converts 'emotional pain' into physical pain is called a *somatiser*. In these cases, the patient may feel severe pain in some part of his/her body without any identifiable cause in that part.

A patient already suffering from chronic physical pain in a part of his/her body e.g. low back pain can more easily become a somatiser as the pre-existing physical pain presents a ready focus for somatisation. Thus a pre-existing low back pain may get worse if the patient finds him/her self under stress.

A patient may have chronic pain in one area of the body due to an organic cause such as arthritis and this can then trigger functional pains in other parts. So a patient may start off with a back problem and after some time start complaining of pain in many other areas of the body also called *global pain* or *total body pain*.

Chronic Pain can also appear as a result of mental illness such as depression.

In cases where such functional pain exists, the pain cannot just be treated by painkillers or by injections; such pain needs the help of a skilled psychologist or psychiatrist.

Many people attending pain clinics, quite understandably, become upset if the doctor suggests referral to a psychologist as they think that the doctor does not believe that their pain is real and that it is all 'in their mind'

Whilst it is undoubtedly true that some pain specialists are invariably more prone than others to see pain as an almost completely emotional experience, the emotional side of pain must, however, never be underestimated.

On the other hand neither must the emotional aspect of pain be overestimated since not every case of chronic pain is accompanied by a strong functional element.

In some cases, there may be no physical cure available for a painful problem and in such cases, the patient must be taught how to live with and cope with his/her pain.

This is done by means of specialised multidisciplinary -Pain Management Programmesø(see later on).

Type of Pain	Example	Symptom
Nociceptive	arthritis	Grinding pain
Neuropathic	Post herpetic neuralgia	Burning, stabbing
Functional	depression	variable

TABLE 1

Pain Transmission

It is useful to have some basic knowledge of the way in which pain is transmitted.

We will now look at a *very* simplified version of an extremely complicated topic; the

Science of pain is a rapidly expanding field as new information is frequently presented from centres all around the world.

A. PAIN RECEPTORS

The Pain receptors or nociceptors are situated at the endings of certain nerves; they are present everywhere in the body, being more plentiful in some areas such as the skin and joints and less plentiful in others such as the gut.

The brain itself does not have any pain receptors and therefore cannot directly feel pain

Broadly speaking, there are three types of receptors which are involved in the pain pathway, viz mechanical, thermal and chemical depending on the type of sensations, which they can pick up.

Mechanical receptors respond to excess pressure and to mechanical deformity,

Thermal receptors respond to excess heat ($> 45^{\circ}\text{C}$) and cold ($< 5^{\circ}\text{C}$) while

Chemical receptors respond to chemicals applied to the body as well as to substances, which are naturally released, by the body itself in response to trauma or inflammation.

Once the painful stimulus has been picked up by the receptor, it travels along special nerves to the spinal cord from where it is then transmitted upwards to the brain.

Nerves which travel to the spinal cord are called *afferent* nerves, a large number of these afferent nerves are involved in the transmission of pain.

When the body is attacked by a painful stimulus, two types of pain arise, viz. an initial immediate or fast sharp pain followed by a later delayed or slow more widespread pain.

If, for example, you cut your finger you feel an immediate sharp pain, which is then replaced by a later, much duller pain.

The sharp pain serves a useful function as it makes you immediately withdraw your finger from the threat to your body; this achieved by a so-called, *reflex arc* which takes place due to impulses triggered at spinal cord level by the pain which then set off impulses transmitted via large so-called *efferent* nerves to the muscles of the arm. The later pain does not, as a rule, serve any useful purpose except to act as a continual reminder that damage has taken place.

It is this later slow pain, which can in due course become chronic pain.

Normally the slow pain eases away as the damage heals itself but it may sometimes persist either because the condition which has caused the damage, such as arthritis, is progressive or for reasons we do not as yet fully understand, but possibly due, at least in part, to sensitisation of the pain pathway (*see below*).

B. Pain Pathways to the brain

In the spinal cord, immediate pain and delayed pain are both transmitted to the brain via different pathways.

Most pain initially reaches the *thalamus*, a sort of relay station in the brain.

From the thalamus, impulses immediately pass to other specialised parts of the brain, which deal with physical sensation, emotion and interpretation.

Whereas immediate pain is transmitted to specific areas of the brain, which allows for the precise localisation of the pain stimulus, delayed pain is distributed much more widely in the brain.

Different areas of the brain produce different responses.

This explains the whole range of symptoms which pain can cause, such as emotional disturbances, depression, disturbed sleep, mood changes etc.

Modern brain imaging techniques can actually show different parts of the brain being activated in response to painful stimuli or even in anticipation of painful stimuli.

In chronic pain, progressive changes will occur in the brain with re-mapping of higher centres i.e. with different parts of the brain becoming involved as the pain becomes more long-term.

C. Spinal Cord Receptors

Within the spinal cord itself there exist other receptors, which can increase or decrease the painful impulses as they whiz up to the brain from the tissues.

This activity is called *modulation*.

These receptors are mostly activated by substances called neuropeptides. Special drugs can target these receptors in an effort to reduce pain.

In chronic pain states, there is constant stimulation of the pain-increasing receptor sites in the spinal cord; this has the effect of magnifying the chronic pain impulses as they enter the spinal cord on their way up to the brain.

This process is referred to as '*wind up*'.

Normal non-painful sensory information coming from the skin (such as light pressure) and also travelling to the brain via the spinal cord can actually block pain sensations coming from the same area of the body; this pain-blocking mechanism is referred to as *inhibition*.

Everyone knows that when you injure a part of your body you can often *rub* it better. This is made use of in the technique known as TENS-Trans Cutaneous Electrical Nerve Stimulation.

Another interesting fact is that pinprick sensations applied to the body can also block pain through yet another inhibitory mechanism; this is made use of in Acupuncture, a technique which also stimulates the body to release naturally occurring pain killing substances called opioids (see below).

The spinal cord acts in some way like a gate, blocking some pain impulses and allowing others to go through, upwards and onwards to the brain.

Many factors such as previous experience of the same pain, emotional status, age, sex etc can affect the sensitivity of this gate.

The gate is definitely influenced by *higher centres* i.e. the brain; thus, an athlete may train him/herself to subdue pain, which would floor Mr Average!

D. pain pathways from the brain

When the pain impulses reach the brain from the spinal cord, they set off signals, which then descend from the brain back to the spinal cord through a complicated system of nerve connections. (*descending pathways*)

These, signals acting on the spinal cord, reduce (damp down) the transmission of the pain impulses, which are being sent to the brain by the spinal cord. Memories of previous painful experiences, cultural factors and other similar factors can all trigger such signals. In other words, the brain is trying to close the gate or reduce the intensity of the pain coming up to it.

There is some experimental animal evidence, which suggests that other descending pathways may exist which can actually increase the level of the pain. These would act to open the gate or increase the intensity of the pain coming up to it.

Thus the brain itself can damp-down (or even, perhaps magnify) pain impulses as they enter the spinal cord. Many of these pathways are poorly understood.

So, to repeat, the spinal cord acts in some way like a gate, blocking some pain impulses and allowing others to go through, upwards and onwards to the brain. The brain itself can close or open this gate.

The areas of the brain, which process pain, are richly supplied with a system of naturally occurring substances called opioids.

These opioids are released from their storage areas in the brain when painful impulses reach the brain; they attach themselves to special sites (called opioid receptor sites) in the pain pathway so as to block the transmission and perception of pain.

It is these sites, which can be affected when drugs such as morphine are given to block pain.

E. Sensitisation

On the Continent, the gradual conversion of *slow* pain into chronic pain is called *chronification* and it may be due, at least in part to a process known as *sensitisation*

Sensitisation can occur at various places in the nervous system; it can happen peripherally at the nerve endings and/or centrally at the spinal cord or even in the brain itself.

Peripheral Sensitisation

Long-term inflammation continually irritates the peripheral pain receptors (in skin, muscle, joints and the viscera) and causes them to discharge with greater intensity and for longer periods of time.

Pain receptors normally require a high level of stimulation before they discharge (the level at which they discharge is called their threshold).

When peripheral sensitisation takes place, the pain receptors may gradually require a lower degree of stimulation to be set-off (a decreased threshold).

Peripheral sensitisation takes place due to the release and action of a host of inflammatory substances released by the body at the site of tissue damage.

Pain doctors often flippantly refer to these chemicals as the inflammatory soup.

Some of these substances constitute suitable targets for pain-killing drugs.

Peripheral sensitisation therefore consists of a reduction in threshold together with an increased responsiveness in the peripheral pain receptors.

It contributes to the increased sensitivity to pain found at the site of tissue damage and inflammation.

A simple illustration of peripheral sensitisation is the change in the sensitivity to heat, which occurs after sunburn. Here, a gentle stimulus such as a tepid shower actually feels burning hot in the sunburnt skin.

Central sensitisation

(a) spinal cord

In chronic pain, with continual bombardment of the spinal cord from the periphery (skin, muscle, joints, organs or viscera) sensitisation may also be induced at spinal cord level, by the release of other substances, which increase the intensity of the pain message being relayed to the brain.

This happens especially in neuropathic pain when damaged nerves continually fire off without the need of being actually stimulated by anything in particular.

This sensitisation can be partly due to the pain signal itself becoming enhanced and partly due to the normal inhibitory mechanisms, which exist in the cord to dampen down signals, becoming blocked.

The result is a strengthening and increased duration of the pain signals being transmitted to the brain.

The receptors, which these substances act on, also provide targets for pain-killing drugs.

(b) brain

The brain itself may become sensitised by various complicated and ill-understood mechanisms, so that pain is accompanied by more and more emotional and psychological "suffering"

What does it all mean?

The way in which pain doctors try explain the complicated process of sensitisation to bewildered patients is to compare the nervous system to the amplifier in an audio system.

Sensitisation is similar to turning up the volume so that the sound (pain) becomes louder (stronger); sometimes, especially in neuropathic pain, the process of sensitisation leads not only to a stronger pain signal but also to the production of very unpleasant pain. It can also lead to the creation of pain by something, e.g. light touch, which should not normally produce pain. So in addition to the *amplification* of the pain signal we also have its *distortion*.

This distortion is similar to what happens when the amplifier is turned right up so that the sound is no longer pleasant to listen to but becomes highly distorted and thoroughly unpleasant.

What's to be done?

In this day and age, no one should be told to go and live with their pain until and unless everything possible has been done to reduce the level of their pain.

A busy general practitioner just has not got the time actively to concentrate on chronic pain, which is why most district general hospitals now have multidisciplinary pain clinics.

Here a team of specialists can deal with the patient's pain.

The Consultant in pain management takes the main role in managing the pain and he/she can then call upon colleagues who are specialists in other fields, for advice on specific problems.

The pain specialist is an expert in understanding and managing pain and all the emotional baggage that pain brings with it. .

He/she will deal with the pain as a condition in its own right and whatever its cause.

The facilities at the disposal of each pain specialist will vary depending on the enthusiasm or lack of enthusiasm of the hospital authorities.

In the UK, central government does not seem to consider chronic pain to be sexy enough or (more importantly) vote-catching enough to make adequate funding for the management of chronic pain as a problem in its own right.

Until such a time as this mentality changes, Pain Clinics will always be under-funded and under-resourced to deal adequately with the many patients referred to them for management.

The multidisciplinary approach to pain, addresses the pain itself, and, whenever possible, the underlying cause as well.

In many cases (such as arthritis), the disease, which is causing the pain, is incurable, so symptomatic relief becomes the primary goal of treatment.

At the preliminary consultation, the Consultant will assess the severity of the pain (going by what the patient says), sees if there is an underlying cause which can be dealt with and if it cannot be dealt with, then prescribe adequate treatment in order to control the pain.

There are many ways in which the pain can be managed . such as physiotherapy, drug medication, active intervention therapy and psychological mechanisms.

These will be discussed with you
