Chronic pain after surgery

What is chronic post-surgical pain? How common is it? How is it treated? Professor Julie Bruce & Professor Stephan Schug explain

What is chronic post-surgical pain?

Let's start with some definitions – **acute postoperative pain** is the pain experienced immediately after an operation, usually lasting for days or sometimes weeks – this is entirely normal and expected. The surgical incision and surrounding area can be inflamed and tender – again this is fairly normal and is important for wound healing, where tissues and muscles repair themselves after injury.

Chronic pain is normally considered to be pain that persists or keeps coming back for *more than* three months or for longer than the expected healing time. Chronic pain that develops after an operation is often known as '**chronic** or **persistent post-surgical pain'**.

Knowing when pain becomes chronic after surgery is especially difficult because many people have had their surgery to treat a painful condition, such as a painful hernia or a long-standing back problem. Is the pain simply a continuation of the old pain, or is it new? And, even if it is new, is it related to the surgery?

Sometimes it is obvious that something has changed – nerve damage after an operation for hernia repair can be quite different from the discomfort felt before the operation.

Another example is persistent tingling nerve pain in the chest wall after heart bypass surgery, which is very different from angina pain experienced before heart surgery.

Sometimes it is very difficult to tell the pains apart, especially if the original pain (that the operation was done to treat) was not in fact helped by the surgery. However, these are the features that can allow doctors to tell if you have chronic post-surgical pain:

- The pain develops after a surgical operation
- The pain lasts for at least three months after the operation
- Your pain is not thought to be from other causes, such as an infection or cancer
- Your pain is not the same as the pain from the original condition.

Surgical follow-up can be limited to one postoperative appointment, thus a follow-up clinic at approximately 8 weeks, to determine surgical 'success'. Patients are then discharged and managed by the primary care team.

What type of pain is it?

The type of pain can depend on the operation itself, because the painful symptoms often relate to the distribution of nerves in the area of the operation. For example, after groin hernia repair surgery, people have reported pain down the front and inside of the thigh, or in the testicles. This may relate to potential

irritation of nerves in the groin during surgical repair of the hernia.

We now understand more about nerve pain or 'neuropathic pain' which can arise from nerve injury. Typical characteristics and descriptions of neuropathic pain include stabbing, tingling, numbness, altered sensations and problems with sensitivity. It is not always possible to avoid nerve damage during an operation, especially during cancer surgery when removal of the tumour takes priority.

Treatment of chronic post-surgical pain

Treatment does not depend upon what sort of surgery you have had but rather on the mechanism that results in you having the persistent pain. For example, not everyone who suffers pain following a mastectomy will have the same 'type' of pain or for the same underlying reason. The treatment will depend on the characteristics of the pain and also the possible reason for the pain developing and not on the fact that the surgical operation happened to be a mastectomy.

It is important that the healthcare professional listens to your story, performs a thorough examination and allows you to give a full explanation of your symptoms. The healthcare professional then gains an understanding of the problem and the impact the pain has on your daily life. Patients often report finding this approach helpful in itself. Often they feel that, in the past, their symptoms have been dismissed and not taken seriously. Sometimes, people have been told that the pain will go away soon after the operation and this causes mistrust and resentment.

The best treatment for the pain will depend upon the mechanism causing it. Treatments include: tricyclic antidepressants, anti-convulsants, painkillers, TENS (transcutaneous electrical nerve stimulation) and injections. Based on our clinical experience, nerve destruction (peripheral nerve ablation) should not be used in the management of chronic post-surgical pain.

It is not always possible to control the pain and other symptoms adequately. In such cases, a psychology-based pain management approach or physiotherapy support can help you to cope with your symptoms and reduce the impact on your daily life.

How common is it?

A survey asked over 5,000 patients attending pain clinics across Scotland and the north of England carried out in the late 1990s about their reasons for attendance. Twenty per cent of patients thought that surgery was one of the causes of their pain and, of these patients, half thought it was the *only* cause. Until this report was published, chronic pain after surgery was thought to be rare. This is possibly because few patients were asked about persistent pain after their operation.

On average about 30 per cent of patients experience chronic pain after surgery, although this ranges from those with mild symptoms to those with more severe pain.[1] Overall, only about five per cent of people report severe intensity pain, but five per cent is a significant number when you consider the huge number of operations conducted across the UK and globally.

Are there risk factors?

We are beginning to understand more about risk factors for chronic post-surgical pain. As well as the impact on quality of life for those

[1] Schug SA, Bruce, J. 2017, stratification for the development of chronic post-surgical pain. Pain Reports. 2, 6, p. e627.

affected, chronic pain is difficult and costly to treat, so understanding more about who is at risk of developing chronic pain after surgery is important as it may help in preventing the condition.

Certain groups of patients may be more at risk from pain after surgery than others. Women are more likely to experience chronic pain than men, although this is not always the case after surgery. Studies suggest women are more likely to report more severe acute postoperative pain, but the evidence for chronic pain is less certain.[1]

Younger patients do seem to be at greater risk of chronic post-surgical pain than older patients – this has been found after many different operations. This finding might be explained by the fact that younger people are often more active and are working, thus having persistent pain could have a greater impact on their daily life compared to older people who are often less active. Or it may relate to nerve and tissue changes (how we react to pain) as we age.

People with other chronic pains are at greater risk of developing chronic pain after surgery. This may include patients who suffer from such conditions as chronic low back pain, Raynaud's disease, irritable bowel syndrome, migraine, fibromyalgia and other conditions. Changes in the nervous system may well lie behind many of these conditions. There is growing research on the genetics of pain, suggesting that some patients may be more susceptible to pain conditions than others.[2]

Patients who are more anxious and worried about their operation are at greater risk of acute and chronic postoperative pain – so excessive worry and anxiety is a risk factor.[1] Preoperative preparation is vital; for example, a clear explanation about the operation and recovery process setting out the risks and benefits is an essential part of surgical treatment. Many hospitals run preoperative clinics whereby patients attend for tests in advance of their operation. This is an opportunity for careful explanation and discussion between the patient and health care team.

Finally, one of the strongest and most consistent risk factors for post-surgical pain is the severity of acute postoperative pain in the days and weeks after an operation. Treatment and adequate control of acute pain immediately after surgery is very important and may 'dampen' the pain response, preventing longer term symptoms.[1]

More awareness needed

It is clear that chronic post-surgical pain is common, can be severe and may result in distress and disability for patients. Looking at the whole spectrum of chronic pain conditions after surgery, it is very unlikely that the cause of the pain is something that the surgeon has done wrong. It seems more likely that this is the inevitable result of surgery in a certain percentage of patients – approximately 30 per cent of patients experience chronic post-surgical pain of varying severity in the first year after an operation.

If it were more widely accepted that chronic pain can arise after surgery, some patients might decide against having operations that aren't entirely necessary. Surgeons, who are undoubtedly trying to do the best for their patients, would also be reassured that pain is probably not the result of surgical error. Another benefit is that patients would have their pain acknowledged and would be treated more sympathetically.

[2]Denk F, McMahon SB, Tracey I. Pain vulnerability: a neurobiological perspective. *Nat Neuroscience* 2014; 17: 192-200.

Over the last 30 years, there has been a huge increase in medical research investigating the characteristics and potential causes of chronic pain after surgery – this has helped raise awareness amongst healthcare professionals and patients alike. There is still, however, much more work to be done to improve our ability to prevent people from developing chronic pain after surgery and to make sure everyone affected by this all too common condition receives swift diagnosis and treatment.

Finally, let's look at some examples of different operations…

Pain after hernia surgery

Inguinal (groin) hernia is a common condition with an incidence of six per cent to 12 per cent in adult males. It affects men more often that women. The condition presents as a lump in the groin, due to a protrusion of intestine through a weakness in the abdominal wall in the groin. This lump can affect daily activities and is often, but not always, painful.

Surgery to repair inguinal hernia is one of the most commonly performed operations. Some surgeons use key-hole or laparoscopic surgery rather than an open incision. A mesh is often used to repair the abdominal wall weakness, secured in places either using stiches, glue or staples. There is a small risk that the nerves in the groin can become irritated or inflamed by the implant or internal stiches.

Chronic pain after inguinal repair surgery is now a well-recognised condition – it is one of the most widely reported surgical conditions with hundreds of articles reporting prevalence of up to and around 30 per cent. Approximately 5 to 10 per cent of patients report pain after their hernia operation that interferes with daily living.[3] There is now guidance recommending that it is safe for surgeons to 'watch and wait' with some patients who have a small pain-free lump, as long as the hernia doesn't impact too much on their daily activities.

Pain after chest surgery

When you consider what is involved in surgically opening the chest (thoracotomy), it is not surprising that many patients suffer long-term pain afterwards. In order to gain access to the chest, the surgeon has to either remove part of a rib or spread the ribs apart. This inevitably causes damage to bone and nerves lying along the ribcage.

Experience suggests that many of the worst pain syndromes may be caused by partial nerve injury – thus it may be that a 'clean' cut of the nerve has a better long-term outcome, although this can result in numbness and loss of sensation. Although pain after chest surgery is fairly common, the severity of pain varies. In one study, 15 per cent of patients with chronic pain after chest surgery were sufficiently troubled to warrant referral to a pain clinic.

Pain after amputation

Pain after limb amputation is a well-recognised post-surgical pain condition. After limb amputation, the pain can be either stump pain or phantom pain (pain felt in the limb that is no longer there). In stump pain, patients often report a tender spot on the stump and this has led many surgeons to perform further operations to try and find the cause. Patients in the past have frequently had further amputations in the mistaken belief that this would cure the problem. Such operations rarely help stump pain and sometimes make it worse or make it more

[3] Kehlet H. Chronic pain after groin hernia repair. *British Journal of Surgery* 2008; 95: 135-6.

difficult for the patient to wear an artificial limb.

Phantom limb is a feeling or sensation that the limb is still there, this is normal and does not require treatment. But phantom limb pain (pain in the limb which is no longer there) can affect between 50 to 85 per cent of amputees.[4] It usually starts in the first few weeks after surgery. Studies suggest that painful phantom symptoms can last between one hour and 15 hours a day and can vary between five days a month and 20 days. Pain severity can also be very variable.

It is now acknowledged that children get phantom limb pain and that people born without limbs also suffer from it. Recent research has shown that part of the pain after amputation arises due to activity in the brain itself and this underlines the futility of methods of treatment aimed directly at the stump.

Other chronic post-surgical pain syndromes

Other operations with known risks of chronic pain include vasectomy, joint replacement surgery, spinal surgery for back pain and breast surgery for cancer treatment. Other leaflets in this series discuss strategies for the management of chronic pain.

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This leaflet is an update of a previous leaflet published by Dr Bill Macrae, now retired.

[4] Nikolajsen L, Jensen TS. Phantom limb pain. *British Journal of Anaesthesia* 2001; 87: 107-16.

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