Types of Pain in Children with Special Needs and Their Treatment
by Susan Agrawal

Pain and discomfort unfortunately occurs frequently in children with special needs. While pain disorders are often complex, they can be especially difficult and confounding in children with special needs. For example, the types of pain that a child with special needs experiences are often unusual and hard to treat, such as unrelenting neuropathic or visceral pain. Children who are non-verbal or cognitively impaired may have extreme difficulties indicating the source and severity of their pain. Additional medical complexity, such as respiratory issues or constipation, may make treating pain even more difficult.

Despite all of the confounding factors, pain and discomfort in children with special needs can be treated. The first step in determining appropriate treatment is to ascertain what type or types of pain your child may have. This article will discuss some of the most common types and sources of pain, including somatic, visceral, and neuropathic pain.

Types of Pain

Somatic Pain

Somatic pain is one of two types of nociceptive pain, or the kind of pain you most commonly experience when tissues, including skin, muscle, bone, or internal organs, are damaged by any sort of process, such as trauma or hot/cold temperature. Nociceptive pain is so named because sensory neurons in these tissues, called nociceptors, react to negative stimuli by sending signals to the brain, triggering the sensation of pain.

There are two main types of somatic pain, cutaneous (superficial) and deep somatic pain.

Cutaneous or superficial somatic pain occurs when the skin or tissues just below the skin are damaged, such as in a cut or simple burn. Cutaneous somatic pain tends to be sharp in nature and temporary. It also is typically highly localized, meaning the pain is felt in one specific location associated with the injury.

Deep somatic pain affects portions of the interior body, including bones, muscles, tendons, ligaments, fasciae, and blood vessels. Examples include broken bones, muscle sprains, or a pulled tendon. This type of pain tends to be dull, aching, or throbbing. It is
more difficult to localize and tends to last for a longer period of time, until the injury is fully healed.

Like all children, children with special needs experience frequent somatic pain due to everyday injuries. Some children may be more prone to certain types of pain. Here are a few examples:

- Children with cerebral palsy are likely to have hip pain because their hips often do not develop properly and may be out of place or fully dislocated.
- Some children with autism and behavioral disorders may inflict injuries on themselves by scratching, hitting, or banging their bodies.
- Children with certain medical conditions, children who do not bear weight, or children who are on medications that reduce bone density may experience frequent fractures due to weakened bones.
- Children with certain types of dysautonomia may not feel pain and can cause a wide variety of injuries to themselves, including burns and broken bones, without even knowing it.
- Children with cerebral palsy and other conditions that cause spasticity may have pain as a result of the tightening of tendons and resultant deformities of the joints and bones.

Visceral Pain

Visceral Pain is the other type of nociceptive pain, characterized by injury, irritation, or stretching to any of the interior organs, such as the stomach, small intestine, large intestine, pancreas, bladder, or reproductive organs, especially in women. It is most often felt as a cramping or steady pain, which may range from very mild, as in a stomachache, to extremely intense, as in pancreatitis. Visceral pain is often difficult to localize and may be referred to another location. A prime example of referred pain is the pain felt in the left arm during a heart attack.
Some organs, particularly those without many nociceptors or sensory neurons, typically do not trigger a visceral pain response. These include the kidneys, lungs, and liver. Other organs, and especially the gastrointestinal organs and the bladder, have many more nociceptors, and even the most minor injury or stretching of these organs may cause extreme pain.

Visceral pain is actually quite common and is experienced by all of us on a regular basis. Simply eating too much, having a bladder infection, or being constipated can cause visceral pain. In many cases, this is of short duration and can be relieved by treating the underlying cause, thereby eliminating the pain.

The most common triggers for visceral pain include stretching or distention of an organ (such as an overfull bladder or stomach), inflammation of an organ caused by infection or another inflammatory process (such as Crohn's disease), and tissue damage from other causes.

It is common for children with special needs to have altered pain perception, especially children with neurological disorders. This is particularly true with visceral pain, though altered pain perception may involve any type of pain. These children often have **visceral hyperalgesia**, which is an increased pain response to stimuli that are normally uncomfortable. For example, after a stomach virus, the simple act of digestion may cause extreme pain because of hypersensitivity of the viscera. Similarly, the mild distension of the stomach or bladder that occurs normally throughout the day may feel excruciatingly painful to some children.

Another common sensitization response is feeling pain in normally non-painful situations, such as feeling pain when the bladder is slightly full or when the stomach contracts to propel food through the digestive tract. Pain to non-painful stimuli is called **alldynia**. This sensitization occurs in two ways: either the nociceptors (sensory neurons) have become more sensitive, or the brain's response to normal input from nociceptors is altered.

Children with special needs often experience visceral hyperalgesia, particularly of the gut and bladder. This may lead to vomiting and stomach pain, pain with defecation, irritable bowel syndrome, pain during urination, and other symptoms. In addition, children with complex medical needs may be more prone to certain conditions that cause visceral pain, including pancreatitis, urinary tract infections, constipation, and colitis from *C. Difficile* and other causes.

**Neuropathic Pain**

Neuropathic pain differs from nociceptive pain in that it affects the nerves instead of the tissues themselves. Because it affects the nerves, the quality of the pain is often very different, and can be described as burning, pins and needles, numbness, or itching. In some cases, the pain is more continuous, but often out of proportion to an injury, which is
again called hyperalgesia, or occurs with normal stimuli, which is again called allodynia. Many children with neurological conditions experience both hyperalgesia and allodynia, which causes continuous pain as a result of over-responsivity of their central and peripheral nervous systems.

There are two primary types of neuropathic pain, central and peripheral neuropathic pain. Central neuropathic pain is the result of an altered brain or spinal cord. Peripheral neuropathic pain occurs when nerves elsewhere in the body are affected. In some conditions, including children with neurological issues such as encephalopathy, both the central and peripheral nervous systems may be affected.

Neuropathic pain may affect just one area, as in the case of carpal tunnel syndrome, or may lead to widespread pain, as in diabetic neuropathy or postherpetic neuralgia. These are all forms of peripheral neuropathic pain, in which the pain results from damaged nerves in the arms, legs, or skin. In children with special needs, peripheral neuropathic pain is common in the gastrointestinal tract and bladder, and in some conditions, may cause pain in the arms and legs.

In children with special needs, especially those who have experienced a brain injury, spinal cord injury, or who have conditions that affect the central nervous system, neuropathic pain is very common. It is more likely to be centrally-mediated by the brain and spinal cord in these children, although many children experience a combination of both central and peripheral neuropathic pain.

Children with dysautonomia, which can be primary or secondary in children with encephalopathy, mitochondrial disorders, and other disorders that cause neurological issues, often experience neuropathic pain. Some children with forms of dysautonomia, however, may not feel pain at all. This is the result of damaged sensory and autonomic nerve cells, which may lead to either increased or decreased pain and sensation.

A final type of neuropathic pain is caused when the sympathetic nervous system, which is part of the autonomic nervous system that controls all the "automatic" functions of the body, does not function appropriately. This may lead to the development of complex regional pain syndromes, disorders that include pain to nonpainful stimuli, often after an injury. Additional symptoms include temperature changes and skin changes at the site of the pain, including discoloration and sweating. In children with this condition, the allodynia is so pronounced that they may not even be able to touch the affected part with a feather without causing pain.

**Treating Pain**

The first step in treating pain is to determine the type of pain and the source, if there is one. For example, a child with hip pain due to hip dysplasia or dislocation may require surgery followed by pain medication. Or a child with a chronically distended bladder
may need catheterization to address her pain. A child with painful inflammation of the intestines may require an aminosalicylic acid or a disease-modifying medication.

Of course, determining the source of pain is easier said than done, especially in children who are non-verbal or cognitively impaired. When no obvious source of pain presents itself, you may have to go looking. Parents usually have a good sense of where the pain is, such as GI pain or leg pain. But oftentimes we must convince practitioners of the magnitude of the pain and encourage them to search for a source. See the earlier article on this topic [http://www.articles.complexchild.com/00036.html].

Sometimes it is hard to know if your child is even in pain or is just crying or behaving differently for another reason. A frequently used test is to give your child an age-appropriate dose of acetaminophen or ibuprofen. If you see an improvement, it is likely pain, and more likely than not, somatic or inflammatory pain.

When no source is found in a child with special needs, especially one who has neurological impairment, it is often recommended that a trial of treatment for neuropathic and/or visceral pain be undertaken. Since so many children in this category have these types of pain, it is more likely than not that treatment will be helpful. While some doctors do not feel comfortable treating without an obvious source, recent articles have begun to suggest that a trial is an appropriate strategy for treatment of pain.1

**Treating Somatic Pain**

The first strategy in treating somatic pain is to address the cause, such as casting a broken bone, dressing a wound, or performing surgery on a tight tendon. After the cause has been addressed, then pain management should be employed following a stepwise approach.

- **Step 1:** Ibuprofen or Acetaminophen
- **Step 2:** Naproxen; Cox-2 Inhibitors like Celecoxib; other NSAIDs
- **Step 3:** Tramadol; combination drugs like Acetaminophen plus Codeine
- **Step 4:** Combination drugs such as Hydrocodone plus Acetaminophen; Morphine
- **Step 5:** Strong opioids such as Fentanyl and Methadone; other treatments like nerve blocks

Most doctors will not move beyond Step 2 unless there is a clear traumatic injury or postsurgical pain. For children with ongoing somatic pain, consultation with a pain specialist is essential to receive the treatments in Steps 3 and higher.

**Treating Neuropathic and Visceral Pain**

Neuropathic and visceral pain are much more difficult to treat than somatic pain. There are some medications that work for certain children, but the options are limited. In
general, medications such as those listed in Steps 1-5 above may be used for neuropathic and visceral pain, though the effects may be minimal, even with narcotics. Certain types of visceral and neuropathic pain may also respond to nerve blocks or steroid injections, depending on the cause.

Specific medications for neuropathic and visceral pain include anti-depressants and anti-convulsants, primarily. These include tricyclic anti-depressants such as amitriptyline (Elavil) and nortriptyline (Pamelor), and anti-convulsants like Gabapentin (Neuronin) and Pregabalin (Lyrica). Some doctors have begun to use another class of anti-depressants, serotonin-norepinephrine reuptake inhibitors, including duloxetine (Cymbalta) and venlafaxine (Effexor). Other anti-convulsants and anti-depressants may also be prescribed.

In many cases, a combination of medications, including a targeted medication for neuropathic/visceral pain and a standard pain medication, may be required. Additional medications including anti-spasticity medications, anti-spasmodics, and similar drugs may be used to address specific pain needs.

**When to See a Pain Specialist**

If your child experiences daily pain episodes or frequent pain that impacts his ability to function, it is time to see a pain specialist. Unfortunately, few pain specialists dedicated to children are available, and many of these are not familiar with treating children with very complex medical needs or unusual types of pain. It is often best to bring your child to a major children's teaching hospital or consult a palliative care program when pain is severe and unrelenting.

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