

## Painkillers and pain

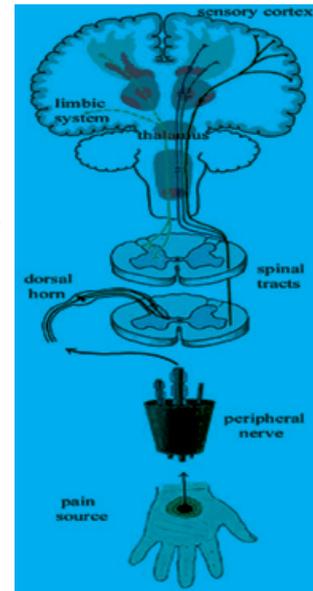
### Worksheet 1 - teacher's notes

1. In English there are many words that get easily confused. Go to [http://www.bbc.co.uk/worldservice/learningenglish/language/askaboutenglish/2010/03/100323\\_aae\\_sick\\_pain\\_page.shtml](http://www.bbc.co.uk/worldservice/learningenglish/language/askaboutenglish/2010/03/100323_aae_sick_pain_page.shtml) and read and listen about the difference between pain, hurt and ache.

*answers directly on the webpage plus worksheet 2*

2. Go to <http://www.nabd.org.uk/living/paingate.htm> and answer these questions:

- Why do we feel pain? *Pain is a signal that the body has been damaged or something is wrong. In evolutionary terms pain was a signal which told us to stop what we were doing or to take alternative action.*
- What is the flight of fight syndrome? *The pain signal is closely linked to what is known as the 'Flight or Fight Syndrome'. This is where our body is put into 'ALARM' status. Our muscles receive more blood flow and oxygen, our heart beats faster, our breathing quickens and we get ready to stand and fight or run from danger.*
- What is acute pain? *Acute pain usually means something new and or serious has happened and we may need to take action (e.g., when we fall and hurt ourselves).*
- What is chronic pain? *Chronic pain is more commonly associated with an old injury or the slow bodily changes which are painful (e.g., 'growing pains' the pains of 'wear and tear', or old age).*



3. Now we are going to look at pain and the pain processes in your body. First go to <http://science.howstuffworks.com/life/inside-the-mind/human-brain/pain.htm> and find answers to these questions:

- What is nociception? *Pain perception, or nociception (from the Latin word for "hurt"), is the process by which a painful stimulus is relayed from the site of stimulation to the central nervous system.*
- What are the four steps of nociception process? *There are several steps in the nociception process:*
  - *Contact with stimulus -- Stimuli can be mechanical (pressure, punctures and cuts) or chemical (burns).*
  - *Reception -- A nerve ending senses the stimulus.*
  - *Transmission -- A nerve sends the signal to the central nervous system. The relay of information usually involves several neurons within the central nervous system.*
  - *Pain center reception -- The brain receives the information for further processing and action.*

Now read how the pain signal travels to the brain:

<http://science.howstuffworks.com/life/inside-the-mind/human-brain/pain2.htm>

[http://www.sciencebuddies.org/science-fair-projects/project\\_ideas/Games\\_p016.shtml#background](http://www.sciencebuddies.org/science-fair-projects/project_ideas/Games_p016.shtml#background)

*students' answers, understanding of the text directly on the websites*

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4. Find what congenital analgesia is and why it is dangerous.

*Congenital analgesia is a rare genetic disorder where the individual is unable to feel pain. You might think this sounds like a good thing, but it's actually a life-threatening condition. Pain serves as a warning against injury, so people who don't feel it can be severely injured hurt by things that most of us would react quickly to. For example, Ronald Melzack and Patrick Wall describe a girl who got third-degree burns on her knees by climbing on a hot radiator. There was no signal for her to stop. Researchers are trying to reproduce this condition by genetically altering mice so that they can study the genetic contributions to pain perception.*

5. How do we cope with pain? Do you know any methods? Watch a short film about painkillers:  
<http://ed.ted.com/lessons/how-do-pain-relievers-work>

6. There are two types of painkillers: opiates and aspirin based drugs. Complete the chart

	Opiates	Aspirin
Come from	<i>poppies</i>	<i>willow bark</i>
Examples	<i>morphine, codeine</i>	<i>aspirin, ibuprofen</i>
Used in	<i>severe pain</i>	<i>mild pain</i>
Work by	<i>They relieve pain in two ways: first by interfering with and blocking the transmission of pain signals to the brain, and then by working in the brain to alter the sensation of pain. These drugs neither find nor kill pain, but reduce and alter the user's perception of the pain.</i>	<i>Unlike narcotics, aspirin drugs are real workhorses that actually go to the source of pain and stop it. When cells are damaged, they produce large quantities of an enzyme called cyclooxygenase-2. This enzyme, in turn, produces chemicals called prostaglandins, which send pain signals to the brain. They also cause the area that has been damaged to release fluid from the blood to create a cushion so the damaged cells don't take any more of a beating. This cushion is the swelling and inflammation that goes along with our aches and pains. When we take aspirin, it dissolves in our stomachs and travels through the whole body via the bloodstream. Although it's everywhere, it only works its magic at the site of cell damage by binding to the cyclooxygenase-2 enzymes and stopping them from prostaglandins.</i>

<http://mentalfloss.com/article/18615/how-do-painkillers-find-kill-pain>

<http://kidshealth.org/kid/talk/qa/ibupro.html>

<http://www.medicalnewstoday.com/articles/161255.php>