



## History Matters

### War and medicine 1812–1918

#### Character Education

- Apply critical skills to primary and secondary sources
- Pursue ideas and developments through time
- Evaluate what wars teach us

#### Facts

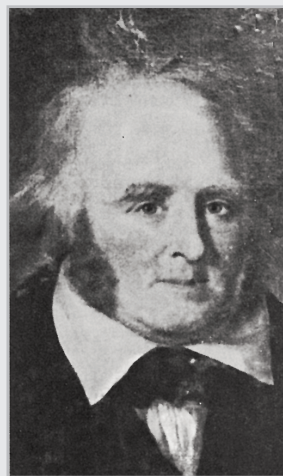
- The Canadian side of the War of 1812 led to 1,600 dead, 3,679 wounded and 3,321 dead from disease. The Americans had 2,260 dead, 4,505 wounded with an estimated additional 8,000 dead from disease
- WWI led to 66,976 Canadian deaths and 149,732 military wounded
- The life expectancy for a male in 1812 was 37-years-of-age

#### Before the Reading

- When large scale disasters occur such as Hurricane Hazel in Canada in 1954, The World Trade Centre terror attack of 2001, the Haiti Earthquake of 2010 or the Japanese Earthquake-Tsunami of 2011 how do the medical profession and media professionals differ in their approaches? Split into groups and list the top three actions the medical establishment and the media would take
- War causes death but it also leads to medical advancements. How does war speed up medicine?
- Make a list of all the weapons that would cause wounds greater than the weapons of the War of 1812

#### Reading

The *New England Journal of Medicine* first started publishing in January of 1812. Its October issue included “On Gun-Shot Wounds”. It’s not surprising that the cutting edge journal dealt with the effects of musket and cannon fire as the American Revolution and the struggles against



William “Tiger” Dunlop  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1878769/>

#### William “Tiger” Dunlop: Surgeon War of 1812

DR. WILLIAM DUNLOP, a man of surpassing talent, knowledge, and benevolence, was born in Scotland in 1792. He served in the army in Canada and in India and thereafter distinguished himself as an author and man of letters. He settled in Canada permanently in

1825 and for more than 20 years was actively engaged in public and philanthropic affairs. Succeeding his brother, Capt. Dunlop, as Member of the Provincial Parliament and taking successful interest in the welfare of Canada, he died lamented by many friends 1848.

*From Recollections of the American War, 1908*

William Dunlop had fiery red hair and a great sense of humour. His humour was well demonstrated in his will where he bequeathed, “Parson Chevasse ... the snuff-box I got from the Sarnia Militia, as a small token of my gratitude for the service he has done the family in taking a sister that no man of taste would have taken.” Dunlop himself had a taste for tall tales

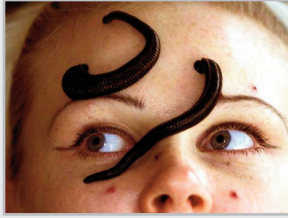
and whisky. He was appointed assistant surgeon to the 89th Foot Regiment in 1813 and according to a 1931 article in the Canadian Medical Association Journal, "Early in the August following, he sailed for Canada, in an ill-found, crowded transport, and spent over three months on the ocean, en route to the scenes of his future labours and adventures."

He arrived in time to participate in the battles of *Crysler's Farm* and *Lundy's Lane*. In Dunlop's own *Recollections of the American War*, he described his hospital after the *Battle of Chippawa*: "I was shown a ruinous fabric, built of logs, called Butler's Barracks .... Nothing could be worse constructed for an hospital for wounded men ... there was a great want of room, so that many had to be laid on straw on the floor, and these had the best of it, for their comrades were put into berths one above another as in a transport or packet, where it was impossible to get around to dress their wound, and their removal gave them excruciating pain." Dunlop worked alone on 220 men from both armies because no other surgeons were available. Dunlop continued, "I never underwent such fatigue as I did for the first week at Butler's Barracks. The weather was intensely hot, the flies were myriads, and lighting on the wounds, deposited their eggs, so that maggots were bred in a few hours, producing dreadful irritation ... for two days and two nights, I never sat down." In his 1931 article Ford described Dunlop during the assault on Fort Erie, "It was here too, that he merited, by his gallantry, the Victoria Cross, had such a decoration existed; for he carried out of the firing line, on his

back, "like sacks of potatoes," 10 or a dozen wounded men, the last of whom received, en route, a bullet in the back, which else had ended the doctor's career, as it did that of the recipient. He also brought, slung over his shoulders, six wooden canteens of wine, with which he refreshed his patients. The young giant of twenty-two, was medical officer, stretcher-bearer, and orderly, all in one." After Dunlop's engagements on the Niagara peninsula he was dispatched to York to take charge of 30 men in the general hospital in the Toronto garrison. "Toronto was then a dirty straggling village, containing about 60 houses. The church – the only one – was converted into a general hospital, and I formed my lodge in the wing of the Parliament buildings, which had escaped, when the Americans had burnt the rest of that fabric." In the spring of 1815 he served with a road-cutting party near Penetanguishene describing the work in wonderful detail in his recollections. The humorous Dunlop once gave three reasons for not going to church: first, a man was sure to find his wife there; second, he could not bear to be at a meeting where one man dominated the conversation; and, third, he never liked singing without drinking. Dunlop kept his beloved supply of liquor in a cabinet on wheels called "The Twelve Apostles". One bottle in the cabinet he named "Judas" as it held only water. Variousy described as doctor, businessman, founder of Goderich, Canada Company man, author, justice of the peace and more, this humorous surgeon is a Canadian well worth investigating.

Napoleon had provided ample research on combat wounds. The War of 1812 that had just started would provide more research data. Although the language of the 1812 article is difficult due to time passed and medical jargon, looking at this primary source challenges our common representations of medicine during the War of 1812. True, sticking your fingers in wounds to take out musket balls and bleeding an already weakened patient with leeches seem barbaric now, but, back then they were part of wider scientific study and the betterment of practices, steps that led to medicine today. Before we scoff at the "primitivism" of 1812, we should consider that when future students read about the medical practices of 2012, they'll consider these practices primitive. **You** are living in a "primitive" age – well, as far as the students of 2139 are concerned.

"The wounds of musquet (sic) balls generally have the form of the body which produces them; they are round, square, or oblong; but when they have two openings, that at the entrance is always larger than that at the exit of the ball. Its edges are depressed; there is a depression near the entrance, while the parts are, as it were, raised, and make a projection towards the other opening. This difference takes place, because at the moment the ball meets the limb, it strikes with its full force, which it loses when it is buried in the thickness of the parts, in overcoming their resistance. The skin at the entrance is supported by the whole thickness of the limb; the point of support favours the solution of continuity and prevents laceration; the contusion is also, for the same reasons, greater at the entrance of the ball, and when the swelling, which is always proportionate to the contusion,



Leeches as medical devices  
[http://www.msnbc.msn.com/id/5319129/ns/health-health\\_care/t/fda-approves-leeches-medical-devices/](http://www.msnbc.msn.com/id/5319129/ns/health-health_care/t/fda-approves-leeches-medical-devices/)

## On leeches and maggots

Although blood-sucking leeches were first used medically back in the time of ancient Hippocrates, by the time of the War of 1812 European countries imported over 100 million

leeches every year to meet the demand. The little suckers were allowed to gorge themselves because they also secreted a mixture of substances that included an anti-coagulant and anaesthetic. In effect they painlessly drained inflamed wound areas where veins weren't working normally long enough for healing to take place. Leeches could suck in up to 10 times their own body weight in blood until they became totally engorged and fell off. Leeches were scarce in England from 1800–1825 but during the War of 1812 Edward Cutbush an officer and surgeon in the U.S. Navy had leeches attached to wound edges to reduce swelling. In 2004 America's FDA cleared medicinal leeches as a medical device; today they are used world-wide for certain skin grafts and for reattachment microsurgery.

Maggot debridement therapy was also approved by the U.S. FDA in 2004. During debridement, which is the removal of dead and damaged tissues, the squirmy blow fly larvae eat away rotting flesh while they secrete anti-bacterial chemicals. Don't worry, the ugly critters don't have a taste for living flesh—so—forget the horror movies. Surgeon "Tiger" Dunlop considered maggots an irritant during the War of 1812 but WWI military surgeon William Baer first saw the value of the

maggot's work during WWI when the wounds of soldiers were cleaner when they'd been infested by maggots. Until antibiotics came into use it was common practice to leave the maggots. Today maggots are employed on any non healing wound that contains dead tissue, including pressure ulcers, venous ulcers, traumatic wounds, surgical wounds, and diabetic ulcers. In July 2012 at a Scarborough, Ontario Hospital, surgeon Dr. Marietta Zorn and a nurse, Rose Raizman, with a wound treatment specialization received Canadian government approval to use blow fly maggots shipped from California. Three times they applied 800 maggots to a patient's leg and then covered it with a mesh dressing for 36 hours so that the maggots could breathe and eat dead flesh. The patient was very grateful that his leg did not have to be amputated.

Why the fascination with leeches and maggots? It's war and medicine 1812–2012.



Maggots to the rescue of Scarborough man's leg  
VIDEO [www.intelligencer.ca/2012/07/06/maggots-to-the-rescue-of-scarborough-mans-leg](http://www.intelligencer.ca/2012/07/06/maggots-to-the-rescue-of-scarborough-mans-leg)

has taken place, the difference between the two openings is more strongly marked; for the entrance is more swelled than the outlet."

...

"A variety of ball forceps have been invented either to discover or extract the balls and other foreign substances, which the wound may contain. The finger is preferable to them all, when it is capable of reaching the foreign body; for the resistance made by bones and tendons, which lie in the course of the wound, may easily pass for some extraneous body."

...

"Such no doubt was the case of a young drummer of the Swiss guards, who received a wound in the shoulder on the 10th of August. The ball had struck under the clavicle, and passed to the inferior angle of the scapula. Professor Boyer extracted it by making a counter-opening .... We determine to make these counter openings the more readily, because a ball never can be extracted by the passage it had entered, without a considerable and painful traction on the part. The new opening also facilitates the discharge of pus, and singularly shortens the cure, which is rendered tedious by the lodgment of this fluid, when the wound has only one outlet."

Between the 1812 scientific investigation of gunshot

wounds to WWI, many medical gains reduced the fatalities from diseases and combat that ravaged armies. Pasteur's discovery of bacteria, Lister's of the value of antiseptic treatment to combat them and the discovery of blood types all proved valuable especially when it was found that direct transfusion of blood from a donor to a patient could save his life. Added to those discoveries, the practices of using field ambulances, forward medical units, casualty clearing stations and nursing meant that the treatment of wounds was quicker and more effective. Lives were saved.

Naturally, new weapons necessitated new inquiry. During WWI the Germans first used asphyxiating chlorine gas on April 22, 1915 against Algerian and Zouave troops and on April 23 against Canadian and English troops near Ypres. One hundred and five years after "On Gun-Shot Wounds" in the *New England Journal of Medicine*, Dr. Arthur Hurst wrote "Gas-Poisoning" in *Medical Diseases of the War*, another scientific inquiry into the wounds of war.

"The first effect of inhalation of chlorine is a burning pain in the throat and eyes, accompanied by a sensation of suffocation; pain, which may be severe, is felt in the chest, especially behind the sternum. Respiration becomes painful, rapid, and difficult; coughing occurs, and the irritation of the eyes results in profuse lachrymation. Retching is common and may be followed by vomiting, which gives temporary relief. The lips and mouth are parched and the tongue is covered with a thick dry fur. Severe headache rapidly follows with a feeling of great weakness in the legs; if the patient gives way to this and lies down, he is likely to inhale still more chlorine, as the heavy gas is most concentrated near the ground. In severe poisoning unconsciousness follows; nothing more is known about the cases which prove fatal on the field within the first few hours of the "gassing," except that the face assumes a pale greenish yellow colour. When a man lives long enough to be admitted into a clearing station, he is conscious, but restless; his face is violet red, and his ears and finger nails blue; his expression strained and anxious as he gasps for breath; he tries to get relief by sitting up with his head thrown back, or he lies in an exhausted condition, sometimes on his side with his head over the edge of the stretcher in order to help the escape of fluid from the lungs. His skin is cold and his temperature subnormal; the pulse is full and rarely over 100. Respiration is jerky, shallow and rapid, the rate being often over 40 and sometimes even 80 a minute; all the auxiliary mus-

cles come into play, the chest being over-distended at the height of inspiration and, as in asthma, only slightly less distended in extreme expiration. Frequent and painful coughing occurs and some frothy sputum is brought up. The lungs are less resonant than normal, but not actually dull, and fine riles with occasional rhonchi and harsh but not bronchial breathing are heard, especially over the back and sides. Headache is generally severe, and there is also considerable epigastric discomfort, due partly to the strain of coughing and partly to gastric irritation, as it is increased if an attempt is made to eat. The intense dyspnea of this asphyxial stage lasts about thirty-six hours, after which it gradually subsides, if death does not occur before. The patient, exhausted from his fight for breath, then falls asleep and wakes up feeling much relieved."

The treatments Dr. Hurst discussed in his article turned out to be incredibly similar to those suggested in "On Gun-Shot Wounds"—bed rest, various drugs to induce vomiting and even bleeding. Prior to WWI there had been research into the use of oxygen that was applied to gas patients. A new oxygen delivery apparatus devised by Dr. Leonard Hill for unconscious patients was introduced on the battlefield: "... a foot-pump feeds a face-mask through a flexible tube; by each down stroke a measured volume of air or oxygen is pumped into the lungs, and by each upstroke a valve is opened which allows the air to escape by the elastic recoil of the thorax and lungs. From time to time the fluid is evacuated by squeezing the thorax and hanging the head over the side of the stretcher." Dr. Hill later pioneered the use of the oxygen tent.

In roughly 100 years, medicine came a long way to reduce battlefield casualties. But, just at the end of WWI as immune systems were down, a great influenza pandemic broke out taking with it 21 million individuals—more than those killed during WWI. The returning troops brought the killer to Canada; 50,000 died. Canada established the Federal Department of Health in 1919 as a direct result of the Spanish Influenza.

Medicine in war was making progress but so were sanitation, medication and nutrition. However, there was still a long way to go. The life expectancy for a male in 1812 was 37-years-of-age. By 1919, the end of WWI, the life expectancy of a male was 48.4 years. In 2011 Statistics Canada placed life expectancy at 80.7 years of age.

## After the Reading

Use a marker to highlight the sentences you understand in the articles from 1812 and a different colour to highlight words you don't know. Try to guess the meaning of the unknown words from the words around them, or the context. Once you have as much as you can understand, compare your points with others in the class

- What makes the primary sources "On Gun-Shot Wounds" (1812) and "Gas Poisoning" (1917) difficult to read? Why is it sometimes worth the effort to read primary sources?
- Use an image search to find a picture of one of the following: Zouaves, ball forceps, oxygen tent, bacteria, or casualty clearing station. Report on your findings to your class
- The medical researchers in 1812 and 1917 take a scientific approach to their investigations. Are they cutting edge? Why or why not?

## Extensions

- Create your own timeline of medical advances from 1812 to 1918. Make those advances that came from war stand out
- Compare Hurst's description of poison gas with that of poet Wilfrid Owen in the poem "Dulce et Decorum est pro patria mori". Which is more effective in giving you a feeling for the horrors of gas warfare?
- Search the Reading and Minutes for a person who interests you and prepare talking notes to tell the class more about him or her

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