

Sanitation a Top Medical Milestone

More Than 150 Years of Medical Marvels: Sanitation Voted the Greatest Advance Since 1840

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Jan. 18, 2007 — - If it were up to you to decide what has been the greatest medical advance of the past 150 years, what would you choose?

That's exactly the challenge the prestigious British Medical Journal posed to a small group of experts and the many thousands of their readers, mostly doctors. Well, almost exactly.

They actually were looking for the greatest medical advance of the past 167 years, back to 1840, the year the journal was founded.

What comes to mind? In 1840, we didn't yet know about viruses and bacteria. Louis Pasteur established the germ theory in the 1860s, but it didn't really catch on until almost 1880. Germ theory is pretty important, and a good contender.

Florence Nightingale is credited with establishing standardized training for nurses, but she did not open her school until 1860.

Anyone who has ever had a bone heal after wearing a cast may owe a debt to an X-ray. William Roentgen invented those in 1895.

According to legend, we owe antibiotics to some moldy bread and the insight of Dr. Alexander Fleming. Fleming discovered penicillin in 1928 and it was first used to treat human infection in 1941. Antibiotics are of monumental importance, and might get your vote.

We learned about the structure of DNA -- the double helix at the foundation of life -- from Watson and Crick in 1953.

The World Health Organization announced the eradication of smallpox in 1980. The product of an immunization program, this was the first and only time human beings have completely eliminated an infectious disease.

We didn't have anesthetics until 1846 (I am about to have an operation on my knee, so personally, I'm pretty thankful to Dr. William Morton for this advance!). The electrocardiogram (ECG) was first developed in 1903 by Willem Einthoven. Dr. Gregor Pincus gave us oral contraceptives in 1955. The cardiac pacemaker was developed in 1957; the CT scan in 1973; and diagnostic ultrasound in 1979.

Dr. Christiaan Barnard performed the first heart transplant in 1967; Dr. Robert Jarvik invented the artificial heart in 1982. Hemodialysis for kidney failure first became practical in the 1960s. Recent decades have given us MRI scans, robotic surgery, laparoscopy, endoscopy, angioplasty, coronary bypass surgery and a decoded genome.

Readers of the British Medical Journal initially submitted over 100 nominations. Then, the journal invited experts to develop a list of the 15 top medical advances from among the nominees, with each expert offering a defense of his or her choice. The list, including many of the breakthroughs above, was opened up to the journal's readership for voting. Votes came in from over 11,000 people, many of them physicians.

In light of the truly staggering medical breakthroughs and scientific advances of the past 150 years, I think the final outcome of the contest will shock you. The ultimate winner? Sanitation!

How can it be that seemingly mundane, homely sanitation -- including sewage, reliably clean water, and decent housing -- could possibly earn more votes than Nobel Prize-winning advances? Because the best measure of a medical advance is not its complexity, but what it does for the length and quality of our lives.

The average human life expectancy increased nearly 35 years over the span of the 20th century. Roughly 30 of those 35 years are attributable to improvements in sanitation and living conditions that have dramatically reduced the toll of infectious diseases, malnutrition and exposure to the elements.

Sanitation received 1,795 votes. Antibiotics was a close second with 1,642 votes and anesthesia took third.

The original champions of the sanitary revolution were Dr. John Snow, who showed that cholera was spread by water in 1854, and Edwin Chadwick, who came up with the idea of sewage disposal and piping water into homes in the 1840s.

The journal's contest was a wonderful opportunity to reflect on the forward march of medical understanding and acknowledge the dramatic advances of science and the power to prevent and treat disease.

In the end, though, it highlights that our well-being generally owes more -- even in the age of the decoded genome -- to living conditions, public health practices and public policies than to the cutting edge of medical technology.

Add to that list the influence of lifestyle choices and personal behaviors on health and you have a powerful formula for medical advances you control -- no Nobel Prize required.

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