

# Medical Milestones

## **Pre 1900s**

### **Dogs, Rabbits**

Treatment for rabies — deadly disease marked by convulsions and death; affects wild and domestic animals; can be transmitted to humans.

### **Sheep**

Treatment for anthrax — disease marked by rise in body temperature followed by depression, spasms, respiratory or cardiac distress, convulsions, and death. Devastating epidemics were recorded up until the 19th century.

### **Chickens**

Treatment for beriberi — a vitamin B deficiency that causes heart and nerve impairment.

### **Cows**

Treatment for smallpox — one of the world's most dreaded plagues, estimated to have caused 2,000,000 deaths as recently as 1967; declared eradicated in 1977.

## **1900s**

### **Rhesus Monkeys, Dogs**

Treatment for pellagra — a niacin deficiency marked by skin lesions, intestinal and nervous system disturbances.

### **Dogs**

Treatment for rickets — a

vitamin D deficiency causing defective bone growth in infants and children.

### **Dogs, Rabbits**

Development of cardiac catheterization techniques — a procedure which allows doctors to insert a flexible tube into an artery or vein to the heart; used for injecting drugs directly into the heart to measure blood flow and pressure, diagnose and treat congenital heart disease and narrowed passages.

## **1920s**

### **Many Species**

Discovery of thyroxin — one of two major hormones secreted by the thyroid which enables the body to use oxygen.

### **Dogs**

Discovery of Insulin — to control diabetes, a chronic disease of the pancreas marked by the inability to utilize carbohydrates, excess sugar in the blood and urine, excessive thirst, hunger and urination, weakness and emaciation' can cause blindness and death.

## **1930s**

### **Horses**

Prevention of tetanus — also called lockjaw, an acute infectious disease of

humans and other animals characterized by painful muscle spasms and convulsions.

### **Cats**

Development of anticoagulants — drugs that inhibit the action of blood clotting factors that, in excess, can cause clots, phlebitis, embolisms and lead to death.

### **Dogs**

Development of modern anesthesia — allowing artificially induced unconsciousness or local or general insensibility to pain.

## **1940s**

### **Guinea pigs, Rabbits**

Treatment for Whooping Cough, also called pertussis, among the most acute infections of children; a highly communicable respiratory disease characterized by short, dry coughs; serious complications include convulsions and brain damage. Species studied: guinea pigs and rabbits.

### **Rabbits, Monkeys**

Treatment of rheumatoid arthritis — a disease in which the connective tissues of the body become inflamed; cause still unknown, but medications relieve pain and control

inflammation.

### **Rats, Mice, and Rabbits**

Therapeutic use of antibiotics — development of penicillin and other broad-spectrum antibiotics revolutionized the treatment of bacterial infection in humans and other animals.

### **Chickens, Guinea Pigs**

therapeutic use of streptomycin — the first antibiotic effective in treating tuberculosis, pneumonia, spinal meningitis and typhoid fever.

### **Rhesus Monkeys**

Discovery of the Rh factor — the ability to detect the Rh antigen in red blood cells marked a breakthrough in the immunology of pregnancy.

### **Horses**

Prevention of diphtheria — an acute contagious disease marked by formation of membranes in the throat and other air passages, causing difficulty in breathing, high fever, weakness and often death.

### **Guinea Pigs, Rabbits**

Treatment for whooping cough — also called pertussis, among the most acute infections of children; a highly communicable respiratory disease charac-

terized by short dry coughs; serious complications include convulsions and brain damage.

## **1950s**

### **Rabbits, Monkeys, Rodents**

Prevention of poliomyelitis — also called polio or infantile paralysis, marked by symptoms ranging from mild infection to extensive paralysis. In 1950, 33,344 cases were reported in the U.S. alone; today, the disease has been eradicated in the Western Hemisphere.

### **Dogs**

Development of open heart surgery and cardiac pacemaker — revolutionized treatment for people suffering from severe heart disease.

### **Rats, Mice**

Discovery of DNA — determines individual hereditary characteristics.

### **Rats, Rabbits, Monkeys**

Discovery of chlorpromazine and other tranquilizers — chemical compounds used to reduce hyperactivity, anxiety and tension.

### **Moneys, Rabbits, Rodents**

Development of cancer chemotherapy — can bring about remission of different cancers, either short-term or permanently.

### **1960s**

#### **Monkeys**

Prevention of rubella — also called German Measles, an epidemic viral disease marked by low fever, rash, enlarged lymph glands; can cause severe fetal defects in pregnant women.

#### **Rats, Guinea Pigs**

Development of lithium — for prevention of manic depressive illness and recurrent depression.

#### **Rats, Mice**

Development of antipsychotic and antidepressant drugs — for treatment of various mental illnesses.

### **1970s**

#### **Rabbits, Rats**

Discovery of cimetidine — widely prescribed to treat gastric ulcers.

#### **Monkeys**

Prevention of measles — an acute contagious viral disease, once common in childhood, marked by fever, skin eruptions; can cause death.

#### **Monkeys, Armadillos**

Treatment for leprosy — a chronic, infectious disease marked by severe paralysis, ulcerations, nutritional disturbances, gangrene and mutilation.

#### **Dogs**

Advances in cardiology — including measurement of coronary blood flow, myocardial preservation techniques, and heart transplant and coronary artery bypass techniques.

### **1980s**

#### **Mice, Rabbits**

Development of monoclonal antibodies for treating diseases — marked a milestone in the use of antibodies as diagnostic or therapeutic tools to target specific disease cells.

#### **Dogs, Sheep, Cows, Pigs**

Organ transplant techniques — surgical and medical advances such as anti-rejection drugs to enable heart, liver, lung and other transplants to succeed.

#### **Primates**

Research on communicative abilities — led to the development of strategies for teaching language to children with mental retardation.

#### **Monkeys**

Discovery of genetic factors — leading to treatments for predispositions which contribute to the development of behavior problems such as chronic anxieties.

#### **Primates**

AIDS, Alzheimer's Disease — research is currently

being conducted to understand the role of viruses in degenerative disorders.

#### **Mice, Rats**

Development of gene therapy/replacement — wide potential for future treatments for genetic disorders such as cystic fibrosis.

### **1990s**

#### **Pigs**

Laparoscopic surgical techniques. Minimally invasive surgery vastly reduces the hospital stay of patients, for example, gall bladder patients now go home the same day, rather than facing hospitalization of a week or more. Patients can now return to work in 2-7 days instead of 4-6 weeks.

#### **Fruit flies, Mice, and Rats**

Scientists are closing in on the genetic and environmental factors of breast cancer, the leading cause of death of American women ages 35 - 54.

#### **Mice and Primates**

Gene therapy for cystic fibrosis clinical trials are underway in the first step towards curing a disease that threatens the lives of 30,000 children and young adults in the U.S. If successful, the research could lead to a similar approach for genetic diseases such as

Duchenne's muscular dystrophy and sickle cell anemia.

### **2000s**

#### **Fruit flies and Worms**

Human genome - The genetic map of human beings followed earlier successful sequencing of two lower animals. The sequencing launched a new field of scientific inquiry, comparative genomics, which provides greater understanding of how humans are similar and different from other species. Such information allows scientists to know with greater accuracy than ever the translational potential from research with animals.

#### **Chickens, Fruit flies, and Mice**

First molecularly targeted cancer drug approved to treat a rare leukemia (and later, gastric stromal tumors), Gleevec is a medical milestone in targeting a biochemical error that produces cancer.

#### **Sea Urchins**

The 2001 Nobel Prize for Physiology or Medicine was awarded to three scientists whose discoveries provided an understanding of key molecular regulators of the cell cycle. Scientists believe that understanding these

regulators could lead to new cancer treatments.

#### **Pigs**

Diabetic pigs provide for the first time a reliable model for diabetic heart disease and give researchers a chance to test experimental new drugs and to try to control complications, such as a heart vessel closing up after balloon catheterization.

#### **Mice**

Targeting two genes implicated in multiple sclerosis (MS), scientists were able to identify an antibody receptor and growth-stimulating factor to decrease symptoms of an MS-like condition. The antibiotic, minocycline, delayed the onset of Lou Gehrig's disease and slowed its progression in mice, suggesting a new treatment approach for people. Researchers studied mice with a version of ALS created by genetic mutations.