

The History of Drugs

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Many definitions exist for the term “drug.” For the purposes of this paper, a drug is defined as “an article intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in humans or animals.”¹ Drugs affect biologic systems in both positive and negative ways. Humans have been gaining knowledge of the effects of drugs for thousands of years.²

The first drugs were likely discovered through accident and observation. As early humans tried different plant, animal, and mineral substances, they realized that some substances produced specific effects. They were then able to use the substances that had beneficial effects to achieve desired results, and they passed their knowledge of these “drugs” from generation to generation.³

Early veterinary pharmacology was closely tied to early human pharmacology,³ to the point where the same drugs may have been tried for human and animal illnesses.⁴ Certainly, the practices of human and animal medicine share common beginnings.

EARLY WRITTEN RECORDS OF NATURAL DRUGS

With the development of writing and the ability to record knowledge, the information passed from generation to generation expanded to include organized knowledge about drug substances.³ The earliest written documents indicate that the use of drugs such as herbs, powders, and poultices had a place in religion and mysticism as well as medicine.^{2,4}

Around 3000 to 4000 BC, the Chinese documented the use of herbal medicine to cure illness in humans and valuable animals.⁴ According to legend, Chinese emperor Shen Nung made early discoveries about the medicinal values of herbs. Many of these discoveries are still recognized in modern pharmacy.⁵

Asian, Ancient Egyptian, Sumerian, and Greek civilizations continued to contribute to medicinal developments throughout





1884
Rabies vaccine for dogs announced

1924
Barbiturate use began

1930
Intravenous pentobarbital use began

1946
Penicillin produced synthetically

1951
Effects of fluoride on dental health discovered

1966
Pyrantel introduced

1994
First monthly systemic flea treatment

1997
First veterinary NSAID

1817
Article about morphine and its effects published

1915
First aspirin tablets made

1928
Penicillin discovered

1940
Pantothenic acid (vitamin B₅) synthesized

1950s
Anthelmintic properties of piperazine identified

1955
First polio vaccine licensed

1987
First monthly heartworm preventive

1996
First monthly spot-on flea treatment



the BC period.³ Sumerian clay tablets from 2,100 BC contain pharmacologic “recipes” involving ingredients such as salt, saltpeter, thyme, seeds, roots, and bark. These ingredients were mixed with beer,² presumably to aid in swallowing rather than for further medicinal value. Early Hindus used snake root to treat mental disorders, and Egyptians used opium to treat diarrhea and to “cure” crying babies, who probably had colic.^{2,3}

Hippocrates, an early Greek physician who lived from 460 to 375 BC, believed that there was little use for drugs. Some remnant of this attitude may be preserved in the word *pharmacology*, which is derived from the Greek word *pharmakon*, meaning “potion” or “poison.”² Hippocrates and his followers noted that sick people generally got well even if drugs were not used. However, the scientific basis for medicine was formed shortly after his time by the Greek philosopher Aristotle, who lived from 384 to 322 BC. Aristotle based his ideas on biology-related observations and systematic classifications and recorded much of what was known about natural science at the time, including similarities and differences between the biology of humans and animals.⁴ His student Theophrastus, known as the father of botany, systematically classified medicinal plants.^{3,5}

Dioscorides, from Asia Minor, was the next significant contributor to the history of drugs. Working with medicinal plants as well as drugs from mineral and animal sources, Dioscorides recorded drug names, sources, identification, preparation, dosage, and usage. His work established a structure used and developed for future pharmacopeias.^{3,5} Also from Asia Minor, Galen, who lived from 130 to 200 AD, practiced and taught pharmacy and medicine. His contributions focused on correct compounding and are still useful today. He wrote at least 30 pharmacy-related works.^{3,5}

MEDICINE IN THE MIDDLE AGES

During the Middle Ages, much emphasis was placed on combining multiple ingredients in medicines so that they could be used for any ailment. Today, this practice is known as *polypharmacy*, also defined as “the administration of excessive medication.”⁶ The Middle Ages produced little advancement in the area of pharmacy. However, during this time, the Arabs contributed to drug knowledge by recording new information about crude preparations. Trade in

▲ The history of drugs goes back thousands of years, but many of the specific drugs used today are relatively recent.

drugs and spices – some of which were also thought to have medicinal properties – continued throughout the Middle Ages.^{4,7}

PHARMACY IN EARLY MODERN TIMES

In 1498, the first official pharmacopeia was published in Florence, Italy. The goal was to provide a source for uniform pharmaceutical standards. In 1606, the Society of Apothecaries of London was formed. At that time, an apothecary was similar to a modern pharmacist, preparing and selling medicinal substances. When King James I granted a charter to the society in 1617, he created the first official organization of pharmacists in the Anglo-Saxon world.⁵

MODERN AGE DRUG DISCOVERIES

During the Colonial years in America, pharmaceutical and medical services were provided by governors, religious leaders, and educators. These men used imported drugs as well as drugs derived from local plants. In 1821, the Philadelphia College of Pharmacy was founded; it was the first association of pharmacists in America.⁵ As the development of drugs continued, pharmaceutical education developed with a stronger focus on chemistry and standardization.⁵

Scientists began developing biologicals in the late 1700s and throughout the 1800s. The first diseases these drugs affected were smallpox, diphtheria, and tetanus. Louis Pasteur (1822 to 1895), who is responsible for numerous scientific achievements, discovered that weakened forms of microbes could be used as immunizations for more virulent forms of microbes. His work led to the development of vaccines for chicken cholera, anthrax, and swine erysipelas as well as modern rabies vaccines for humans and dogs.⁸ In 1903, the first US government inspection and licensure policies were implemented for those manufacturing viruses, serums, toxins, and analogous products.⁵ The Pure Food and Drug Act, passed in 1906, gave the US government the ability to enforce United States Pharmacopeia (USP) standards and to bring action against those who adulterated or misbranded drugs.⁹ This act was prompted by the exposure of popular patent medicines for humans and animals as largely ineffective – and sometimes harmful – concoctions.

Until the 1920s in some medical schools and the 1950s in veterinary schools, materia medica (i.e., diluted pharmacy courses) was taught. Materia medica, which has since been replaced by the term *pharmacology*, was the early study of compounding and preparing drugs, usually from natural sources. After 1920, human medicine grew significantly. The introduction of chemotherapy in 1936 and overall drug industry growth after World War II kept the momentum going. As these changes occurred, a greater emphasis was

placed on pharmacology in the medical curriculum. Unfortunately, the veterinary field lagged behind in drug development because of economic factors as well as the fact that the profession was much smaller. After 1950, scientific exploration in the veterinary drug industry began to increase, and although economic and societal factors still contribute to slower progress in this area, significant growth has occurred. During the 20th century and into the 21st century, remarkable changes have occurred in the production and use of human and veterinary drugs.^{3,8}

CONCLUSION

Throughout history, humans have incidentally and intentionally discovered new drugs both in nature and through scientific experimentation. In addition to using plant, animal, and mineral substances exclusively, science has progressed to using these substances as well as their modified forms and laboratory-derived chemical substances. New knowledge in the areas of chemistry, pharmacology, and drug use has led to phenomenal growth in the drug industry. New drugs that are both life enhancing and life prolonging are regularly being discovered and developed. This is an exciting place to be in history because so many beneficial drugs are available and are continuing to be developed. Veterinary technicians can readily appreciate the contribution that drugs make in the care of our animal friends.^{3,7}

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