TIMELINE – CHAPTER 6

THE HUMAN ORGANISM AND THE IMPORTANCE OF NUTRITION

1997 Creation of a hemoglobin-producing plant

Hemoglobin is a protein containing iron that is found on red blood cells. It carries oxygen and carbon dioxide in the blood of humans and many other mammals. A group of French biologists, researching blood substitutes for the treatment of certain diseases and for emergency transfusions, were able to produce human hemoglobin using genetically modified tobacco plants. Thanks to a bacterium, they were able to transfer hemoglobin genes into the tobacco plants. The tobacco cells were then able to synthesize hemoglobin.

1970 Development of the cardiac defibrillator

Cardiac defibrillators, which administer electrical shocks, are used to re-establish contractions of the cardiac muscle in situations when the heart is in arrhythmia or cardiac arrest. In such cases, the defibrillator allows the heart to return to a normal beat. The instrument was developed by Polish-born American doctor Michel Mirowski. The defibrillator, which can be positioned directly on the heart of a patient, came on the market in the 1980s.

1958 First successful organ transplant: a kidney

There have been many attempts to perform organ transplants since the early 20th century, first using organs of animals, then transferring organs from one human being to another. The first successful transplant of a human organ (where the patient survived more than six months) was a kidney. It took place in Boston in 1954 between twins, for whom organ rejection was not a problem—in fact, compatibility was ideal because of their genetic similarity. In Montréal the first successful kidney transplant between identical twins was performed at the Royal Victoria Hospital in 1958. Today many successful transplants are done, including heart, lung, larynx and bone marrow, as well as grafts of the cornea, bone and blood vessels.

1952 Invention of the respirator

The Drinker–Shaw iron lung was invented in the United States in 1928 to resuscitate patients and help them to breathe. The iron lung is a large mechanical respirator in which a patient lies down and is supplied with air for an extended period of time. The first modern automatic electrical instrument, the Engstrom ventilator, was invented in Denmark for victims of a polio epidemic (an illness caused by a virus that results in paralysis) whose breathing was affected. The invention led to development of emergency medical services worldwide.

1941 Discovery of the Rhesus factor in blood

It was in the United States that Austrian-born, naturalized American Karl Landsteiner and his colleagues Alexander Wiener and Philip Levine discovered a new factor in human blood: the Rhesus or Rh factor. Later Levine was first to make the link between this factor and the phenomenon of jaundice in newborns. The Rhesus factor is named after the Rhesus monkey, the species in which the factor was first identified by Landsteiner and his team.

1928 Discovery of vitamin C

Symptoms caused by the lack of an element essential to the human organism have been recognized since antiquity—without knowing exactly what element. In the mid-18th century English physician James Lind discovered that the consumption of citrus fruit played a role in preventing scurvy, a serious illness for sailors at the time. It was only in 1928, however, that Hungarian biochemist Albert Szent-Györgyi discovered and was able to isolate vitamin C in sweet peppers, later earning him the Nobel Prize for Medicine in 1937. He christened this element *antiscorbutic* or *ascorbic acid*. Most other vitamins were also discovered at this time. Around 1933 synthetic vitamin C was successfully produced in Switzerland and England.

1902 First description of blood types

Doctors in the 17th century attempted to perform blood transfusions, but more often than not they resulted in death. Transfusions were then banned until the early 20th century. At this time, Austrian physician and biochemist Karl Landsteiner realized that when the blood of different people is mixed together, agglomerations of red blood cells are sometimes produced. This led to his discovery of blood types A, B and O, for which he received the 1930 Nobel Prize for Medicine. A fourth blood type, AB, was discovered the next year by two of his colleagues, Alfred von Decastello and Adriano Sturli. The classification system of blood types A, B and O allowed for a safer method of transfusion techniques.

1887 First cardiogram

An electrocardiogram is a curve representing the electrical activity of the heart that is traced onto paper by an instrument called an *electrocardiograph*. The first electrocardiogram was made in London by English physiologist Augustus Waller. Later Dutch physician Willem Einthoven developed the electrocardiography technique, and in 1924 received the Nobel Prize for Medicine. Today this technique is widely used to detect an irregular heartbeat and myocardial infarction (heart attack).

CIRCA 1830 Discovery of protein groups

German physiologist and anatomist Johannes Peter Müller discovered proteins, the macromolecules essential to life and the most abundant of living organisms. The term *protein* was proposed in 1838 by Swedish chemist Jöns Berzelius and Dutch chemist Gerardus Johannes Mulder in their description of the composition of its groups. The functions of proteins were not discovered until later in the course of the 20th century.

1807 Invention of the stethoscope

This medical instrument was invented by French physician René Laennec. At first quite rudimentary, the stethoscope initially was little more than a wooden cylinder used for listening to the heart and the lungs. This instrument led to development of the medical examination practice of observing sounds inside the human body to make a diagnosis. In 1819 he published the book *De l'auscultation médiate [Mediate Listening]* describing the diagnosis of heart and lung diseases by this new examination practice. Use of the stethoscope was introduced in England around 1825, then spread to the rest of the world. The instrument itself was refined until the 1960s when today's stethoscope was devised.

1661 Discovery of blood capillaries

Blood capillaries, tiny vessels of the circulatory system, were discovered thanks to observations with a microscope by Italian doctor and anatomist Marcello Malpighi. The discovery followed the research of English doctor and physiologist William Harvey, who in 1628 published a work describing the circulatory system and the role of venous valves.

CIRCA 560 First iron-based treatment of anemia

Anemia is a health concern related to low levels of hemoglobin, or red blood cells. This deficiency slows the transporting of oxygen in the blood. In his publications on pathology and medical therapy, Greek physician Alexander of Tralles was the first to prescribe a treatment to prevent anemia involving the consumption of an iron-based substance—iron is an essential ingredient in hemoglobin.

CIRCA –270 Discovery of heart valves

Valves in the heart prevent blood from flowing back into blood vessels, thereby ensuring that it flows in only one direction. They were discovered by Greek doctor and anatomist Erasistratus, who was the first to describe them following his work on dissecting the human body. He demonstrated the primordial importance of blood in the human body and the central role of the heart in the network of arteries and veins. His work was continued by William Harvey who researched blood circulation at the start of the 17th century.

CIRCA –1600 First known treatise on human anatomy

Egyptians have long practised medicine—and even surgery. The practice of embalming in the time of the pharaohs led to more exact knowledge of the human anatomy. The first known treatise on human anatomy is among the oldest Egyptian medical documents discovered. It contains descriptions of many of the body's important organs, but their function was not then understood.