

## A brief journey into medical care and disease in Ancient Egypt

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### SUMMARY

**Ancient Egypt was one of the greatest civilizations to have arisen, becoming the cradle of scientific enquiry and social development over 3 millennia; undoubtedly its knowledge of medicine has been vastly underestimated. Few artefacts survive which describe the medical organization, but from the extent of the diseases afflicting that ancient populus there would have been much to study. Evidence from papyri, tomb bas reliefs and the writings of historians of antiquity tell of an intense interest in the sciences, humanities and medicine born of an educated society which had overcome the superstitions of its nomadic ancestors.**

### MEDICAL CARE

Evidence of medical organization in ancient Egypt is of two kinds, the literary and the archaeological. Of the former, classic writers, notably Herodotus<sup>1</sup>, who may never have visited the area except around the Greek trading centre at Naukratis in 400 BC, relied heavily upon reports of previous travellers such as Hecataeus of Miletus<sup>2</sup>. There are further brief accounts of medical practice within the Old Testament<sup>3</sup>, Hittite state records<sup>4</sup> and state archives of Babylonia and Assyria<sup>5</sup>. The latter group contains by far the most important and exact body of knowledge. Two of the most important works so far discovered have been the Ebers and Edwin Smith papyri.

The first medical papyrus was discovered in 1862 and was dated to 1600 BC, but it is believed to be a copy of a much older work originally written around 2500 BC and attributed to the 'father of medicine' Imhotep<sup>6</sup>, vizier, architect, physician and astronomer to the Pharaoh Djoser (IIIrd Dyn; Table 1, see Appendix). The Edwin Smith surgical papyrus<sup>7,9</sup>, as it became known, dealt with 48 mostly traumatic surgical cases and, arguably, contains what may be the first description of the circulation of the blood; a claim which, if true, would predate the Greek Democritus's crude description of the circulation in his treatise *On Nutrition*<sup>10</sup> by over two millennia.

In 1873 George Ebers acquired a second remarkable papyrus, the Ebers papyrus<sup>11</sup>, originally from Thebes and dated to 1555 BC, containing 876 remedies and using 500 substances, plus brief annotations on surgery. Unlike the

Table 1 Dynasties of Ancient Egypt and the equivalent time periods (after Manetho)

Dynasty	Period	Approx Date BC
I-II	Archaic	3168-2705
III-VI	Old Kingdom	2705-2250
VII-X	1st Intermediate	2250-2035
XI-XIII	Middle Kingdom	2035-1668
XIV-XVII	2nd Intermediate	1720-1550
XVIII-XX	New Kingdom	1550-1070
XXI-XXXI	Late Period	1070-332
Ptolemaic	Greek Period	332-30
Emperors	Roman Period	30 BC-395 AD

Edwin Smith Papyrus, it lacked the overall coherence and meticulous organisation so characteristic of the former work; however, in its favour was its relative completeness and breadth of discussion.

Many other medical papyri have been discovered: Kahun<sup>12</sup>, Berlin<sup>13</sup>, Brooklyn Museum<sup>14</sup>, Chester Beatty<sup>15</sup>, Carlesberg<sup>16</sup> and Ramesseum<sup>17</sup>, and these, although fragmentary, have provided great insight into ancient Egyptian medical knowledge, and a glimpse into the development of their medical system.

The inception of organized medical care belonged without doubt to the ancient Egyptians at the time of Djoser (IIIrd Dyn), whose vizier Imhotep is credited with the creation of Egyptian medical science, and who later became identified by the Greeks as the deity Asklepios<sup>18</sup>. The Greek philosopher Alexandrius Clemens (AD 200)<sup>19</sup> has suggested that medical knowledge may have existed at even earlier times, as among the 42 fabled Hermetic books of Egyptian medicine he credits Athothis (I Dyn), son of Menes

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the first Pharaoh and uniter of Upper and Lower Egypt, with the volume on anatomy (see Appendix). However, what is certain from archaeological evidence is that by the time of Djoser and Imhotep there existed a well established system of medical care. Hieratic scripts talk of a hierarchy of medical care starting with the 'swnw' (ordinary doctor); 'imy-r swnw' (overseer of doctors); 'wr swnw' (chief of doctors); 'smsw swnw' (eldest of doctors); and, finally, 'shd swnw' (inspector of doctors)<sup>20</sup>. It appears from texts that there was some distinction between physicians and surgeons, the latter as a group were often referred to as 'priests of the goddess Sekhmet'<sup>20</sup> (pp 9–11). Further, it is interesting to note that women were also doctors, with a particular relief describing a certain Pereshet as 'imy-rt-swny', lady director of lady physicians<sup>20</sup> (pp 1–2); this is, however, the only reference so far discovered to support the theory that women also held medical posts in what was essentially a male dominated society.

Doctors were also very much specialized. A certain Sekhetnankh<sup>21</sup> was described as the 'nose doctor' to Sahure (V Dyn; see Appendix) and a limestone bas relief of Iry (IV Dyn), a royal physician, shows him to be 'guardian of the royal bowel movement'<sup>22</sup>. Specific deities were also associated with medical specialization: Duaw (eye diseases); Taurt and Hathor (childbirth and its complications); Sekhmet (pestilence, probably infectious diseases); and Horus (snakebites, probably toxicology). Deities were also associated with specific organs: Isis (liver);



Figure 2  
An  
achondroplastic  
female dwarf  
from the tomb of  
Tutankamen  
(Wellcome  
Institute Library,  
London, UK)

Nephthys (lungs); Neith (stomach); and Selke (intestines)<sup>1</sup>. Physicians aligned themselves with the respective gods or goddesses, according to their specialization.

#### DISEASE IN ANCIENT EGYPT

Ancient Egyptians suffered from a variety of diseases, both congenital and acquired, which developed as a result of their cultural practices and environment.

Although rare, achondroplasia has been depicted in many bas reliefs and ornaments. Two of the finest examples were in the sarcophagus of Djehor (late period) on which was depicted an achondroplasiac dancer, and from Tutankhamun's tomb<sup>23</sup> an alabaster boat sailed by an achondroplasiac. Such was the fascination these individuals inspired that their unique forms were deified as the Bes-god who became the divine protector of pregnant women from the New Kingdom onwards<sup>24</sup>.

The results of consanguineous marriages were often evident within the Pharaonic household. Autopsy of Amenophis III's (see Appendix) mummy demonstrated gynaecomastia and signs of feminization, including hypogonadism probably as a result of inbreeding, and although the father of six daughters he would almost certainly have suffered from a degree of infertility. Two of his granddaughters, Meretatim and Ankhsepenaaten, married close cousins, the former Smenkhkare and the latter the now familiar name of the future Pharaoh, Tutankhaten (see Appendix). Noteworthy is Howard Carter's excavation of Tutankhamun's tomb that revealed a mummified still-born which suffered from Sprengel's disease<sup>25</sup>: a condition most

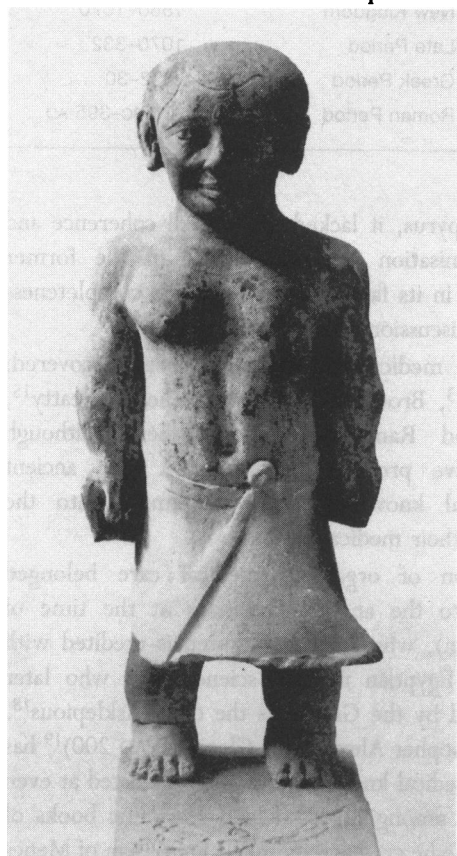


Figure 1  
Alabaster dwarf  
from XXth  
Dynasty  
(Wellcome  
Institute Library,  
London, UK)



**Figure 3**  
**Achondroplastic**  
**on the**  
**sarcophagus of**  
**Djehor, Late**  
**period**  
**(Wellcome**  
**Institute Library,**  
**London, UK)**

likely a result of the genetic stagnation due to the consanguineous practices of the Royal court.

Acquired conditions were numerous, and resulted in significant morbidity among the population, although ironically by the time of the Greek period travel to Egypt to enjoy its dry sunny climate was hailed as a remedy for a multitude of ailments<sup>26</sup>.

Leprosy (*Mycobacterium leprae*) is believed to have arisen in China in the first millennium BC, with the armies of Alexander the Great bringing the disease, via India, to Egypt around 350 BC<sup>27</sup>. In 1980, four skeletons dating from the Greek period<sup>28</sup>, were discovered with leprosy. A far more prolific condition afflicting the Nile valley inhabitants, also caused by a mycobacterium, was prevalent as early as 3300 BC during the initial herding period of Fayium A, namely tuberculosis (*Mycobacterium tuberculosis*). Many statuettes demonstrate Potts disease and tuberculosis has been isolated from many mummies, notably that of Nesperhen (XXI Dyn) whose death was most probably attributable to that disease<sup>29</sup>. Little else is recorded in literature about the extent of infectious diseases although it is thought that Ramesses V suffered from smallpox<sup>30</sup>, on the basis of skin lesions found on the mummified skin of his face and trunk.

Like modern day inhabitants of Egypt the populus suffered greatly from parasitic infections. In 1910 Sir Marc Ruffer, an eminent Egyptologist, discovered mummies dating to the XX dynasty which still contained their kidneys, unusual considering most mummies of this period

were eviscerated and from which were isolated calcified *Bilharzia* eggs<sup>31</sup>. Further demonstration of *Bilharzia* infection and its consequences were found at autopsy of the mummy of Ramesses V (see Appendix) who, apart from skin damaged by smallpox, demonstrated gynaecomastia, enlarged scrotal sac and an umbilical hernia; all complications of long-term *Bilharzia* infection<sup>32</sup>.

The ancient Egyptians suffered numerous epidemics and often tomb art described pestilence and death in years when the Nile's inundation failed. The use of genetic techniques such as polymerase chain reaction (PCR) has enabled medico-Egyptologists to determine the types of infection that afflicted this ancient population and so build a picture of disease migration and prevalence during almost the entire Dynastic period<sup>33,34</sup>. Further parasitic infestations have come to light; Hydatid disease in the lung cavity of the mummy of Asru and a space-occupying cranial lesion, thought to be a tapeworm cyst, in mummy 22940 of the Manchester Museum Mummy collection<sup>35</sup>. The mummy of the XX Dynasty weaver Nakht, in the reign of Smenkhkare (see Appendix), was shown to have been infested with *Taenia*, *Trichenella spiralis* and *Bilharzia*; a situation that must have been commonplace<sup>36,37</sup>.

Other prevalent afflictions in ancient Egypt were arthritis, osteomyelitis and periostitis; of 133 mummies screened in 1961, 30% were shown to have Harris's lines<sup>38</sup>. A further study of 185 Nubian skeletons dating from 1500–1000 BC, showed that women were by far the greatest sufferers from disease, probably as a result of poorer nutrition and the demands of childbirth. Unlike most Western societies, ischaemic heart disease and cancer were both rare as neither the diet nor the relative shortness of their lives predisposed to such conditions. However, the mummy of Ramesses II (see Appendix) was reported to have lived 90 years (after Manetho) and had calcified temporal arteries<sup>33</sup> and that of Lady Teye (XXI Dyn), entombed at Deir el-Bahri, was shown to have atheroma of the coronary arteries and mitral valves<sup>39</sup>. Perhaps the more luxurious diet and sedentary lifestyle of the Pharaohs and their court set them apart from the average Egyptian and increased their risk of ischaemic heart disease.

Examples of neoplasia are few but some cases of osteochondroma<sup>40</sup> have come to light as well as a case, dated to 835 BC, of a female mummy shown to have left breast fibroadenoma<sup>41</sup>. Finally, an unusual case of multiple basal cell naevus was diagnosed after the discovery that two skeletons from Asyut (approx 1000 BC) had multiple cystic lesions of the jaw and bifid ribs.

The great diversity of disease provides some idea as to the clinical problems faced by the ancient Egyptian 'swnw', the management of which was often based on remedies devised by the physician and passed down from generation to generation in papyri and by word of mouth.

History has not been kind, and little of the true knowledge that the ancient Egyptians possessed has been bequeathed to us. With good fortune prevailing there will undoubtedly be further discoveries of material relating to medical practice and organization. Until such time we must content ourselves with an even closer scrutiny of the available material and further examination of the vast number of mummies in various collections.

## APPENDIX

### Selected list of Pharaohs

- Djoser IIIrd Dyn* 2647–2628 BC. Vizier Imhotep designed step pyramid at Saqqara. Tomb at Beit Khallaf near Abydos.
- Athothis I Dyn*. Reigned 57 years and built palace at Memphis. Considered to be a physician. Tomb located at Abydos (Petrie).
- Menes I Dyn*. Legendary founder and uniter of Upper and Lower Egypt. He diverted the Nile to found Memphis and protect it from flooding. He was killed by a hippopotamos after reigning 62 years. Tomb at Abydos (Petrie) or Saqqara (Emery).
- Sahure (or Sefhres) V Dyn*. 2470–2456 BC. Made expeditions to the land of Punt to acquire incense and precious woods. He is one of the three brothers named in the legend on the Westcar Papyrus prophesized to be born of the Sun God Re. Pyramid at Abusir.
- Amenophis III (or Amenhotep III) XVIIIth Dyn*. 1358–1340 BC. Son of Tuthomosis IV and Queen Mutemuia. Married to Queen Tiye, parents were Yuya and Tuya. Worship of Aten (Solar Disc) favoured during his reign. Built a great temple at Luxor. Tomb in the West Valley of the Kings.
- Smenkhkare XVIIIth Dyn*. 1340–1338 BC. Perhaps the son of Amenhotep III and Queen Sitomu, brother of Tutankaten. He married Meritaten, daughter of Amenhotep IV who had also been Amenhotep IV's wife. Meritaten, however, died and Smenkhkare then married Ankhesenpaaten, another daughter and wife of Amenophis IV.
- Tutankhaten (later to be Tutankhamun) XVIIIth Dyn*. 1338–1328 BC. Perhaps the son of Amenhotep IV and Queen Sitamu. Brother of Smenkhkare, he married Ankhesenpaaten, the daughter and wife of Amenophis IV and of Smenkhkare. Although born a follower of Aten, upon becoming Pharaoh he renounced Amenophis IV's god and restored the Theban god Amen-Re.
- Ramesses V XXth Dyn*. 1151–1138 BC. Thought to be a usurper of the throne, he may have been the brother of Ramesses IV, but not next in line as he was deposed by the rightful heir, his brother Ramesses VI, who also usurped his tomb in the Valley of the Kings.
- Ramesses II XIVth Dyn*. 1279–1213 BC. Ramesses the Great, son of Seti. A mighty warrior who led the army in

numerous conquests. Built the Ramesseum at Thebes and a temple at Abu-Simbel. He had many wives and, supposedly, over 100 children.

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