

## The history of blood letting in medicine

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Blood letting has accompanied humans throughout history since the ancient days, and as may be rightly assumed, at the beginning it was an element of magical rituals and initiation rites, not used in medical practice. However, after some time – surely due to the belief that any disease or injury has a demonic origin – the belief was adopted that a body and blood contaminated with “Evil” should be purified. At that time, purification procedures became more frequent and enemas and blood letting found a medical justification to support their use.

The Egyptian *Ebers Papyrus*, which dates back to the middle of the 2nd millennium before Christ, contains fragments suggesting the use of deep skin incisions, i.e. scarification, which was seen as a form of therapy. Blood flowing out was supposed to efficiently limit the development of a number of diseases and alleviate the patient’s spiritual condition. It is possible that the Egyptians contributed to the fact that Greek physicians adopted the idea of blood letting. In the Hippocratic era, i.e. in the 5th century before Christ, blood letting performed via venesection was maybe not widespread, but at least known and used to restore the internal balance in the body. It corresponded with the principles behind the humoral theory, the foundation of which was provided by the rules governing appropriate proportions of four liquids – phlegm, yellow bile, black bile and, of course, blood. The name of the procedure, **phlebotomy**, was derived from the Greek words *phlebos* – “vein” and *tomos* – “cutting”, and the procedure itself successfully entered the scope of available therapies.

A Roman nobleman and a polymath, **Aulus Cornelius Celsus**, described scarification and cupping on previously incised skin, i.e. so-called “wet cupping”, as efficient methods for the treatment of local lesions and disorders. Venesection was practiced in prolonged and persistent fever and in the treatment of apoplexy. Even the famous **Galen** referred to blood letting and recommended this procedure in particular for chronic inflammations and for moderating the heart rhythm, as well as in migraines and high fevers. He was convinced that blood is subject to “exhaustion” and as such leads to poisoning the body. Therefore, he indicated the necessity of performing phlebotomy. At the same time, he stressed that both the time of the procedure and the amount of blood let should always be strictly specified. It is difficult to decide to what extent Galen’s indications impacted the development of blood letting practices, although he

was surely considered as one of the greatest physicians of all times, over time becoming an authority figure of monolithic proportions.

A thousand years after Galen, in High Middle Ages, an alchemist and physician, **Arnold de Villanova**, considered blood letting to be useful for the treatment of any diseases known to mankind. Blood letting and wet cupping were also used by Islamic physicians, including **Rhazes, Avicenna and Maimonides**, and although the latter directly described the procedure as risky, he also stated that it is actually indispensable in serious conditions.

**Phlebotomy** was continuously practiced in the medieval era and maintained its value up to the early modern period. In the 18th century, the surgeon **John Hunter** followed the ancient teachings and performed blood letting in the therapy of inflammations; he also stated that it is necessary to repeat the procedure many times. Along with the use of laxatives and enemas, phlebotomy constituted the basis of therapy applied by one of the most recognized representatives of the University of Edinburgh, **James Gregory**. **Benjamin Rush**, a physician from Philadelphia and one of the signatories to the United States Declaration of Independence, has also become a supporter and promoter of blood letting. Rush believed that “vessel tension” pathology was the origin of all diseases, thus he considered phlebotomy as the cornerstone of each treatment plan, as it allowed for the much-desired “relaxation”. **François-Joseph-Victor Broussais**, a professor of general pathology and one of the medical giants at the turn of the 18th and 19th century, perceived inflammation as the only significant origin of all diseases and treated it with diet and leeching. He administered these to his patients so often that his therapy was equated with “vampirism”. Obviously, this did not mean abandoning venesection or scarification, which were still practiced.

And it must be noted that the above-mentioned were only the figurative tip of the iceberg. Blood letting became a widespread practice and was fully approved by both physicians and their patients not in the Middle Ages, often unfairly referred to as the Dark Ages, but in the Age of Enlightenment that was dominated by knowledge and science. Therefore, it is not surprising that these were the times when scarifiers were developed – tools used for blood letting that were often ornately decorated and became a symbol of “modern” medicine.

A representative of the Parisian clinical school, **Pierre-Charles-Alexandre Louis**, was remembered as the creator of the numerical method – *méthode numérique* – which should be considered the genesis of medical statistics. Using simple table summaries and percentage calculations for analyzing parameters identified on the basis of a set of medical histories of patients with developing pneumonia, Louis came to a conclusion that the confidence placed so far in the positive influence of phlebotomy procedures in the course of a studied disease cannot

be confirmed by facts. In other words, he did not consider blood letting to be useless or harmful in general, but not effective enough in the case of pneumonia. It may be said that Louis was the first to indicate that the commonly accepted treatment method of the time is not always a good choice in therapy. However, it were not the French clinician's works published in 1828 and 1835 that played a key role in the history of blood letting, but rather the modern studies of a Polish physician, **Józef Dietl**, who first worked in Vienna, and later in Cracow.

In 1848–1849, a comprehensive, consisting of more than a hundred pages work of Józef Dietl, summarizing his 5-year clinical observations, was published twice. The study included 380 patients with primary pneumonia and the objective was to evaluate the therapeutic usefulness of blood letting. What set Dietl's approach apart was the decision to divide patients into three groups: the first group underwent phlebotomy, the second group was treated with high doses of emetics, while the third group only followed a pre-determined diet that was considered completely neutral. It can be said that this was the first documented example of “placebo” use in a clinical study.

Dietl showed that mortality among patients in the two first groups was slightly above 20% and less than 7.5% in the third group. A similarly low percentage of deaths was observed when pneumonia was treated only with homoeopathic agents. Clinical management backed by the results of anatomical and physiological observations proved that blood letting not only does not support the treatment of patients with primary pneumonia, but clearly increases the risk of death in such cases and should be withdrawn from clinical use. Two years later, Dietl provided another detailed report – this time including a group of 750 patients of both genders – which unequivocally proved a correlation between advanced hepatization of the lung tissue and blood letting applied at any time during life. Thereby, Dietl's works provided “hard evidence” confirming the harmfulness of phlebotomy in treating pneumonia.

Slightly later, the English internist **John Hughes Bennett** came to conclusions similar to Dietl's and presented these in public in 1855 during a lecture for medicine students. Despite the increasing number of those doubting the effectiveness and reasonableness of such procedures, one must bear in mind that even in the second half of the 19th century in the British Isles, it was common practice to perform blood letting twice a year in healthy – or at least considered healthy – individuals, which may be perceived as a peculiar ritual in medical prophylaxis. At the beginning of the last decade of the 19th century, Richard Quain, a physician to Queen Victoria, mentioned over a dozen of indications for blood letting. The list included, among others: pneumonia, asthma, uremia, menstrual disorders and fever. Even though these cases of blood

letting were less radical than several dozen years earlier, it did not mean the practice was discontinued.

Reports drafted by physicians over the entire course of the Great Spanish Influenza Pandemic of 1918, when blood letting was also practiced, confirm that the phlebotomy tradition was kept alive. Blood letting was mentioned in medical therapy handbooks as late as in the twenties or even the thirties. Today, it is still used in the treatment of one porphyria type, polycythemia vera and hemochromatosis. Efficacy of blood letting in chronic urticaria is also under consideration.

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