

Development of Health Care in Dubrovnik from 14th to 16th Century – Specific Features of Ragusan Medicine

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ABSTRACT

The eastern Adriatic coast saw the development of the city of Dubrovnik, which became a large trading naval power, especially since the fourteenth century and onward. Although the city thrived economically, its seaborne trade with the East and hinterland brought about a great risk of various disease epidemics. To ensure its trading prosperity, identity and its very existence, Dubrovnik implemented different preventive medical measures – the most famous of which is the introduction of quarantine. A large range of people, from Ragusan nobility, special healthcare officials and trained physicians, took care of the population's health, the lack of which would mean the loss of Dubrovnik's trading status and power. With its many hygiene and medicine regulations, it was ranked among the most developed European cities, while retaining the distinctive features of its medicine.

Key words: history of medicine, Dubrovnik, plague, leprosy, quarantine, medics

Introduction

In most publications, the cities of Northern Italy are considered to be leaders of medical development in the Middle Ages. However, one of the cities on the eastern Adriatic coast also achieved an excellent quality of public health care which influenced other Mediterranean cities and towns in its hinterland. Dubrovnik, a considerable merchant power, played a major role in the development of preventive medieval medical practice. Due to its frequent maritime trade, diseases spread from sea and hinterland trade routes and became a threat to its population of the time. In order to defend against them, Ragusan people developed a complex and powerful defense system, which was also influential in a few other European cities. The greatest of these inventions is certainly quarantine containment. Ragusans used quarantine to try to solve the problem of detecting infected people before they entered the city and spread the disease inside.

Ragusan medicine was highly developed not only during disease outbreaks, but also on an everyday basis. All sick citizens of Ragusa were entitled to free medical care. Thus, health care in Dubrovnik achieved a level similar to that of the most developed European cities of the time. This paper gives an overview of the main features of Ra-

gusan medicine from the 14th to the 16th century and the features which it had developed.

First Mention of Medicine in Dubrovnik

The earliest medical influence on the area probably came from the East, from Egypt through Asia Minor and Greece to the region of Dubrovnik, as a remnant of Sumerian, Assyrian-Babylonian and Syrian-Phoenician cultures. Medicine back then was closely connected to nature, and illnesses were marked by symbols of nature¹. These ideas also spread to the Illyrian lands in form of a cult of the snake-deity which was very popular. It was especially worshiped in Epidaurus (Cavtat) as the anthropomorphic god Asclepius, as well as in Dubrovnik. Asclepius was a god of medicine in ancient Greek mythology. The proof of his worship in Dubrovnik is visible on the relief of one of the seven capitals in the porch of the Rector's Palace, built by the Italian builder Onorrio Giordano de la Cava². These capitals and their allegorical meanings are mentioned by Filip de Diversis, who in his work *Opis slavnoga grada Dubrovnika* (Description of the Famous City of Dubrovnik) describes the capital showing Asclepius as a physician³.

The director of the humanistic school in Dubrovnik, Nicolò de la Ciria from Cremona, wrote a hexametric inscription in Latin near Asclepius' capital, claiming that Asclepius was born in the Dubrovnik area².

Apart from the cult of Asclepius, the character of Saint Blaise was also important for development of medical consciousness in Dubrovnik. The people of Ragusa declared Saint Blaise as their patron saint in 972. He was the bishop of Sebaste in Armenia in the third century, but he was also linked to the medical profession⁴. According to medieval legend, he saved the life of a child who was choking because a fish bone was stuck in his throat. The very fact that he cured the child by praying illustrates the broad meaning of the term treatment in medieval Dubrovnik. Although the awareness of the possibility of a disease being cured had been developing, it was still closely associated with religion. In Dubrovnik, on February 3, people still commemorate this event with a procession and the obligatory blessing of the throat, or *grličanje* in Croatian².

Sanitary Conditions in Medieval Dubrovnik

Since the 12th century in European cities, the awareness of public hygiene importance (the promotion of good health of the human body) and sanitation (the prevention of contact with human and animal waste) is becoming more and more important. The oldest sanitary regulations, which controlled street cleanliness, the sale of various foodstuffs, and the construction of residential buildings were introduced in Augsburg in 1104. This was followed by Italy, which also adopted sanitary regulations⁵. Similar regulations were later introduced by Dubrovnik, which very early on recognized the importance of human health and its connection with economic prosperity of the city⁶. Italian cities spread their culture, ideas and achievements to Dubrovnik, especially from 1205 to 1358, when the city was under Venetian rule. The development of early medicine, both in Italy and Dubrovnik, was particularly influenced by the famous European medical school from Salerno (*Schola Medica Salernitana*), from which ideas came to Dubrovnik in the late 11th and early 12th century. The school attracted young physicians, surgeons, and pharmacists who came to Salerno for the purpose of gaining education or to get certified. Since the 14th century, Ragusan government employed physicians educated in Salerno (e.g. Ricardus de Salerno, Petar Maracianus de Salerno)⁷, and some works written in Salerno were preserved in the city. For instance, in the Ragusan chaplain Nikola Barne's testament from 1527, the book of health rules of the school in Salerno (*Regimen sanitatis Salerni*), which he bequeathed to Dubrovnik, is mentioned⁷.

The economic progress also influenced the very outward appearance of the city, which is why the city of Dubrovnik underwent great changes, especially in the period from the 14th to 16th century. In fact, from a predominantly small settlement with wooden houses and narrow dirty streets, in time it turned into a city that was mostly built

out of stone, with tiled streets, a well-regulated flow of water, and a sewerage. Such a feat was achieved thanks to its well-organized maritime trade, and trade relations with the Balkan hinterland, in which the Ragusan nobility played a large role⁸. Trade relations paved the way for the development of the city, but also for the spread of diseases. In order to improve sanitary conditions, the Ragusan Statute of 1272, with the addition of later regulations, introduced a number of measures dealing with the introduction of a health care service¹. Among other things, the Statute states in which locations the garbage should be disposed, in what manner people should handle feces, and that street cleanliness should be maintained⁹.

The Statute also stipulates that each house must have a septic tank and that sewers in the old part of town should be cleaned every ten years at the expense of the owner of the house. In order to do this effectively, government officials were in charge of supervision⁶. Later, a regulation was introduced prohibiting the extraction of filth from septic tanks during the day; it should only be done during the hours of the night⁹.

Likewise, many regulations on urban planning can be found in the Statute, especially because Ragusan people noticed the danger that threatened them since the majority of houses in which they lived were still built out of wood. The great fire of August 16, 1296 was an additional incentive for the construction of stone structures in the city, and thus for better sanitary conditions. Nonetheless, there were still wooden houses in Dubrovnik because these were cheaper to construct, which meant that Dubrovnik won't be a stone-based city until the 16th century onward¹⁰. Still, Dubrovnik had continually carried out various measures that raised the quality of life in the city to a higher level.

Grmek states that in order to improve overall sanitary conditions of life in Dubrovnik, the government paved the city streets in 1389, and in 1415 introduced the service of public cleaners⁶, consisting of four Ragusans: Milutin Krančić, Novak Vokojević, Milat Milčinić and Budislav Bogavčić¹¹. The importance of street cleanliness is illustrated by the fact that Ragusan government punished those citizens who did not comply with their regulations with a fine. To keep Dubrovnik even cleaner, the Statute of 1272 prohibited leather tanning inside the borders of the city¹. In addition, great care was devoted to the supply of clean drinking water, similarly to other European cities. At first, water was supplied from cisterns, until in 1437 the city got a water supply system built by Onorfio de la Cava⁶. In the period between 1407 and 1436², Dubrovnik also got a complete sewerage system, although the existence of a smaller earlier sewerage in the city is mentioned in 1397¹¹.

In order to improve sanitary conditions, on November 28, 1336 Dubrovnik introduced a regulation which forbade people to allow their pigs to enter the city streets. Given that this regulation was often violated, Ragusan Government had to adopt another regulation in 1398 which permitted any person seeing a pig on the street to take it and slaughter it for personal use. The same regulation was

repeated in 1430 and 1463, while in 1482 pig owners in the area of Pile and Ploče were ordered not to let their pigs roam outside these areas. Dogs which sometimes walked around the city in large numbers were similarly problematic. In an attempt to solve the dog issue, in 1409 Ragusan government adopted a decision which stated that all dogs had to be either tied or forced out of town. If a dog was not tied and walked freely on the streets, it had to be killed. Even as late as 1458, Ilija Lukšić was chosen to chase away dogs which gathered in Luža, around the church of Our Lady and St. Blaise, and to clean up after them. The significance of the problematic number of dogs in the city is illustrated by the fact that Ragusan government had to repeatedly make more stringent regulations to try to prevent the gathering of dogs in the city¹¹.

Sanitary measures in Dubrovnik were constantly improved because the city was forced to find a way to protect itself from diseases and at the same time retain the lucrative trade relations which formed its economic base. This necessity combined with Ragusan practical experience from the past enabled a strong development of medical practice, meaning that in time Dubrovnik became a kind of focal point of medical knowledge that spread to the interior of its hinterland⁶. Dubrovnik was particularly influential on Serbian medieval medicine, which included the areas of Serbia, Zeta and Raška. There are many examples of physicians employed by Ragusan government who have practiced medicine outside of Dubrovnik's borders for some time. Ragusans sent their physicians to the rulers from the Nemanjić dynasty, and to various Bosnian and Serbian noblemen for extended periods of time. In order for a physician to temporarily leave his service in Dubrovnik, he had to obtain a permission from Ragusan government, and to confirm that he will still receive his salary in absence¹². Although Ragusan government sent physicians abroad at their own expense, some of them also received gifts from local noblemen. For instance, Daniel Pasini, a physician from Verona who treated the despot Stefan Lazarević, received a monthly prize of 80 gold ducats¹². But in some cases, the government stopped paying the salary to a physician who broke the agreed length of stay outside of Dubrovnik. Some physicians were even reluctant to leave the city, and found various excuses to stay in Dubrovnik. Since traveling of the time was often very uncomfortable and dangerous, some physicians were more inclined to stay within the city¹.

Influence of Medieval Medical Theories on Disease Treatment

Early medical awareness in Dubrovnik was developed because of frequent diseases which occurred in the city. Medical treatment of diseases was greatly influenced by Hippocrates', Galen's, and Aristotle's teachings until the 17th century¹³. The concept of treatment entailed the area of contemporary internal medicine, and it included the notion of curing diseases through prescription medication, as well as various hygienic and dietary instructions. One of the most widespread theories was the humoral theory which was adopted by Hippocrates, and later systematized

by Galen. Its usage became widespread, with Greek, Roman, Muslim, and later European physicians including it into their practice. According to this theory, the human body consists of four basic humors, the imbalance of which causes the disease. The treatment's main goal then is to re-establish the balance of humors in the body. This was most commonly achieved by changing the patient's diet or by bloodletting (which was a common medical practice until the 19th century). Hippocrates distinguished human behavior by the responsible excess or lack of a specific fluid. Galen later additionally systematized this and introduced different human temperaments which depend on the body's dominant liquid: sanguinic, choleric, phlegmatic, and melancholic¹⁴. Medical schools used Galen's works as textbooks until the late Modern Age. Since his words were taught as facts without further questioning, medical progress had been relatively slow. Under the influence of Salerno and Hippocratic medicine, Italian physicians employed in Dubrovnik treated their patients in a similar way. They sometimes wrote comments and summaries of various ancient works and published them in order to spread their ideas.

Ideas about sanitation, the maintenance of personal hygiene, and the importance of clean air were especially spread. Air-purification was one of the major measures taken against the spread of plague: huge fires were lit in the streets, at intersections, squares, and even in individual homes. Bonfires burned even in the summer, and herbs, resins, ointments, and sulfur were thrown into them¹⁵. People even smelled sponges soaked in vinegar or infusions of aromatic herbs. Ragusan chronicler Nikola de Ragnina mentions air-purification by fire during the epidemic of 1347: »It was very contagious. There was no cure and everyone was dying. When people saw that their physicians could not defend them, they decided to leave the city and purify the air with fire«¹⁶. In his book *Diversis* also mentions the good position and »good air« in Dubrovnik which he links with shorter duration of plague epidemics in Dubrovnik. In the book, it is also mentioned that the people, after they had returned to the city they fled from during the plague, did not notice any signs of disease within the city which they attributed to »good air properties«³.

Aside from treatment, Italian cities also relied on heavenly protection against disease, and on the promotion of atonement and devotion rituals to prevent the diseases from spreading. According to the Christian vision of the world, first disease appeared as a result of the Fall of Man, or individual sin. Therefore, diseases also implied a certain degradation of spirit, not just of the body. Treatment of the flesh was always associated with treatment of the soul, and the dead were guaranteed at least a Christian burial¹⁷.

Diseases in Dubrovnik: Leprosy and Plague

Due to its seaborne and land trade connections, Dubrovnik had been an easy target for the spread of various diseases throughout history. Although the most dramatic ones were leprosy and plague, Ragusan people also suf-

ferred from malaria, syphilis, dysentery, pectoris, and various inflammations and infections¹¹.

No help came from the fact that there were many superstitions surrounding diseases. The Catholic Church had great influence over the attitudes toward treatment. It was believed that disease was a punishment from God and the only way to treat it was by repenting. This was particularly true in the case of leprosy, which was considered a godly punishment for lust because its symptoms are similar to those of syphilis¹⁸. The most common symptoms of leprosy were lumps on the face and other parts of the body that would completely disfigure the patient, general weakness, pain or complete loss of sensitivity.

The attitude of people towards lepers was extremely negative. They were considered to be unclean and immoral, and were most often completely isolated from communal life. The Ragusan Statute, which was adopted on May 29, 1272 contains clear sanitary regulations of the early Ragusan community, and also mentions leprosy. In Book VI, Regulation 56 »Houses built in the leper's area« indicates the existence of a leprosarium in Dubrovnik already in the 13th century. This regulation allows the construction of houses for tanners »in the area where lepers usually gather«, meaning that in the time of the Statute's publication (in 1272) there was already a developed system of leper segregation in Dubrovnik⁹. Prior to being placed in isolation, each leper was subjected to examination. If the disease was diagnosed, the patient was condemned to civilian death⁵.

Leprosaria or lazarettos, named after St. Lazarus the saint protector of lepers, were used to completely isolate the diseased, and the magistrates of Dalmatian cities built them to prevent the spread of leprosy. Leprosaria were most often built by Mediterranean cities which, because of maritime trade, were at risk the most. Apart from the Ragusan leprosarium, which was documented in 1272, other Dalmatian coastal cities introduced them as well. For instance, they were documented in Split in 1332, Trogir in 1372, and Zadar in 1426¹⁹. Leprosaria in Dubrovnik were located outside the city walls, and lepers were financed by the state, alms or testaments. At the head of the leprosarium was the elder *capitanaeus*, who was a kind of a mediator between the patient and the outside world. In 1472, the head of the leprosarium was Radonja, *procurator et suprastans leprosorum*, who himself suffered from the disease¹¹.

Testaments left by some Ragusans also testify to the existence of lepers in the city. Some of the testators mentioned are Živko Milinović (1444), Mihoč Đurković (1447), and many others who left their money to help the diseased¹. The intensity of the fear of sickness is illustrated by the fact that Ragusan government had on several occasions ordered the banishment of a group of lepers who came to the city. They mostly came from Ragusan hinterland, especially during the time of Ottoman expansion into those areas. The exact number of diseased people in Dubrovnik cannot be determined in that time period, but it is assumed that there were no more than thirty. At the beginning of the 16th century, the number of lepers in Du-

brovnik began to diminish and in time there was no more archival data about them²⁰. Nevertheless, the cult of St. Lazarus remained equally strong in Dubrovnik. In fact, in 1532 in the Ploče area next to the leprosarium a church dedicated to St. Lazarus was built by the Lazarin Confraternity, citizen-traders who became rich due to Levantine trade¹¹. The church remained there until the beginning of the 20th century¹. Another illustration of St. Lazarus' cult importance is the fact that even today in Italy there are places that carry the old name *borgo San Lazzaro* (village of St. Lazarus), which proves that lepers lived there sometime in the past¹⁵.

But the plague was far more dangerous for Ragusan life. The disease spread rapidly, both across sea and land routes, and it most commonly reached the city because of trade. Symptoms of the most common type of plague, the glandular (*bubonic*) plague, are high temperature, headache, and swollen lymph nodes (buboes) occurring together with fever. The incubation lasts from 2 to 15 days and this type of plague is fatal in 30-75% of cases¹⁰. Unlike lepers, the people suffering from plague died relatively quickly. Plague in Dubrovnik took the greatest number of lives in its first outbreak in 1348/49, and plague epidemics periodically broke out in the 15th and 16th centuries¹¹. Authors Zlata Blažina Tomić and Vesna Blažina note that »after 1533, in Dubrovnik, there were no more domestic fatalities, while Italy was caught by two more outbreaks in 1575 and 1630«²¹. During the plague, care of the sick and the implementation of measures against the spread of disease were taken over by health officials, barbers, and gravediggers while trained physicians fled from the city. Coming up with the solution to plague outbreaks was no easy task, especially when its link to the trade and the economic prosperity of the city is considered. To stop maritime and land trade, especially with the eastern regions and the hinterland, from which the plague spread most often, would reduce the risk of plague epidemics, but at the loss of existing economic and social structure in Dubrovnik. As in the case with leprosy, the only available way of preventing the spread of the disease was isolation.

At a time when real plague disease agents were not known, the best possible solution was prevention. Dubrovnik solved this problem by establishing a quarantine on July 27, 1377 in the Liber Viridis clause which states, *veniens de locis pestiferis non intret Ragusium vel districtum* (»the one who comes from the area with the plague present ought not enter Dubrovnik or its surroundings«)²². With this regulation, the Grand Council forbids newcomers from entering Ragusan territory. They must first spend one month on the Mrkan or Bobara islands and if they show no symptoms of disease, they may enter the area of Dubrovnik. In his article written on the occasion of the 600th anniversary of quarantine containment, Mirko Dražen Grmek considers the invention of quarantine as one of the greatest medical achievements of the Middle Ages²³. Although we currently know that plague incubation lasts from 2 to 15 days, depending on the type of plague, Ragusan initial 30-day quarantine was later turned into a 40-day one, after which it was named (lat.

quaranta). It is important to note that the idea of quarantine came from noble, and not medical circles. The health officials (*kacamorti*), known for their pragmatism and practicality, came up with the idea of quarantine based on previous experience²¹. Grmek, in the aforementioned article, also states that the experience of Ragusan authorities with leprosaria influenced the establishment of quarantine. They were motivated to find a practical solution for the problem of trade, which was also a threat to the economic well-being of the city. Quarantine proved to be an extremely effective solution that was later adopted by other Mediterranean cities as well, such as Marseilles in 1348, Venice in 1403, and Geneva in 1467¹⁹.

Glesinger states that during the time of the Black Death epidemic physicians were practically helpless because none of the treatment methods they had tried helped their patients. Given that fear started to rapidly grow, people frequently prayed to the saints (especially St. Francis, St. Rocco, and St. Sebastian) had processions, built churches, and brought various votive gifts. In Europe, the flagellant movement had appeared. The flagellants were whipping themselves and thus released all the sins they committed, believing that they would be saved from the plague in such a way. Flagellantism from Northern Italy spread to Germany, France, etc. It is mentioned in Dubrovnik in 1215⁵.

In times of the plague crisis, especially great sacrifices were asked from the nobility. Under the motto there is no better thing in this life than the well-being and preservation of one's homeland (*con zo sia che in questa vita presente non sia alcuna cosa piu suave, cara e al'omo libero piu degna ch' al ben stato dela soa propria patria...*)²² nobles were obliged to put the common good in front of their personal interests. Special health officials, called *kacamorti*, were chosen among the most prominent nobles. During plague outbreaks they had a particularly wide authority, and were responsible for monitoring the quarantine and other measures related to the reduction of plague spread (e.g. tomb sites). They had extensive constabulary and sanctioning powers. One of their main tasks was to prevent the uncontrolled escape of the population from Ragusa. If caught trying to escape from Dubrovnik, men were being punished by the act of digging the eyes out, and women by cutting their nose off²². The Senate chose five noblemen who, until the end of the epidemic, had the authority of the Grand Council. They made regulations with the force of law, commanded the guard and the defense of the city, sent offenders to prison, and elected city officials. Due to their unusually large powers, they had to discharge their duties after the end of the epidemic, and inform the Grand Council of their every action²².

Quarantine Development

At its very beginning, quarantine containment was carried out on the islands of Mrkan and Bobara, in open or temporary wooden structures that could be burned down in case of plague. However, due to the poor living conditions on these islands, which in some cases were almost deadly as the disease itself, a better solution was

considered. In 1397, the Grand Council decided that the monastery of St. Mary on the island of Mljet will become the first stone object intended to be used as quarantine. Although a stone building provided better conditions, due to the strategic danger of a distant quarantine becoming the enemy base of Venetians or Ottomans, Ragusan authorities decide to build other quarantines closer to the city core.

The first one, built by the famous architect Mihoč Radi in 1457, was located on the Danče peninsula, west of the Dubrovnik city center²⁴. Today Danče is synonymous with the Franciscan monastery of the Immaculate Conception. In that area, they built wooden houses, the Church of Our Lady of Mercy (locally known as Lady of Danača), and a cemetery. In addition to the priest, who took care of spiritual needs of the sick, the quarantine also employed a surgeon, two citizens to control anti-epidemic measures, and gravediggers. The gravediggers, whose job was burial of the dead, had one of the hardest professions because they were in contact with infectious diseases on a regular basis. Plague victims were buried in a large pit in Danače until the major epidemic of 1482, after which this quarantine became too small for the needs of the ever-growing Ragusan trade²⁴.

After temporary use of the existing shelters on Mrkan and Bobara, and a new quarantine on the island of Lokrum which was never used, the question of the quarantine's location was finally settled, and a new construction was built east of the Dubrovnik city center, on the coast near the Ploče suburb. It was ideally positioned because it was located at the intersection of trading routes near the so-called *Tabor*, an enclosed space for the change of goods where the main Ottoman route for caravans from Bosnia and Herzegovina ended¹⁹. Because of such the quarantine at Ploče had such ideal position, it was not just a maritime sanitation, but a sanitary cordon for the mainland as well. The construction of the building began in 1627, and the completed complex consisted of ten buildings with five inner courtyards (so-called *badžafari*), and a water tank.

Types of Medics in Dubrovnik

Various works on medicine in Dubrovnik often mention medics of different kinds, but rarely give a more precise definition or a specific description of their work and practice. Medical service in Dubrovnik was modelled after the one in cities of Northern Italy, and the first archival data about it dates back to the 13th century. During its existence, Ragusa employed physicians who received a municipal wage. Most commonly, these were foreigners from Italy (e.g. Salerno, Ancona, Venice, Padua, and Bologna). The first known physicians in Dubrovnik were masters Joseph, Johannes from Tevis, and Guilelmus from Ascoli. The first physicians with of Croatian descent was Prvoslav from Dubrovnik²⁵. There was no university on the eastern coast of the Adriatic Sea, so the government often asked Ragusan traders, diplomats, and envoys to find physicians in the Italian cities and bring them to Ragusan municipal service²⁶. Such medics, either physicians or sur-

geons, received a decent annual salary from the Ragusan government, including lodging costs.

The practice of employing physicians who were obliged to treat all the inhabitants of Ragusa for a municipal salary began in 1305 when master Marko was employed and had to treat the people of Ragusa for no other compensation apart from his annual salary²⁷. Only with the decline of Ragusa's wealth and power at the end of the 17th and in the 18th century, the local medics, e.g. Marko Flori (1696-1756) and Luka Stulli (1772-1828), could gain more influence because foreigners were no longer as interested in working for Ragusa as before²⁸. At the same time, Ragusan government most often employed two physicians and one to two surgeons. They did not have the status of citizens but foreigners, and they mainly stayed in service for one year, less often for two. In addition to physicians and surgeons, whether in municipal or private service, there were also various specialists, barbers, healers, pharmacists, and gravediggers in the area of Dubrovnik. Gravediggers were a special part of the sanitary staff who were in charge of transporting dead bodies from their original location to the cemetery, and burying them there. Physicians and surgeons who received municipal wages were obliged to treat the nobility and the citizens of Dubrovnik free of charge, to take care of public health, and to testify in court in cases of suspected death or bodily injury caused by violence, especially when blood was shed²⁹.

Although physicians and surgeons are equally respected today, this was not the case in medieval Dubrovnik. At that time, there were significant differences between them, not only in job descriptions but also in rank. Physicians (from lat. *physicus*) were educated people who completed medical studies at one of the European universities. Due to the small number of universities existing back then, and a long and hard period of study (four years and over)³⁰, educated physicians were highly valued. In archival sources, they are usually referred to as *magister physicus*, *medicus physicus*, *doctor in physica*, *doctor medicinae* or simply *physicus*²⁵. Their reputation was also evident in their salary, which was about double the amount of a surgeon's wage (in the 14th and 15th centuries about 400 ducats)³¹, but also in their social influence.

However, even though noblemen were forbidden to enter into the medical profession by class regulations, Filip de Diversis, a well-known humanist pedagogue and scholar, writes about how a physician sat near the rector during church processions »if there was no one of higher position or dignity«³. Therefore, due to their prestigious education and the large role they played in preserving the health of the city, they were highly honored. But surgeons (*medicus ciorgolus*, *medicus plagarum*, *medicus chirurgus* etc.)²⁵ were not appreciated equally. Although surgeons in Northern Italian cities received short formal education, they mostly had practical medical knowledge. In order to study medicine, Latin was required so surgeons often wrote and learned from manuals written in vernacular languages. Surgeons were usually introduced to the medical profession by an older surgeon, with whom they spent several years as apprentices before starting their own practice,

while some surgeons just inherited their father's profession. With the development of medicine in the 16th century, they became specialized for certain areas or procedures, similarly to traveling surgeons who performed high-risk surgeries but were not employed by Ragusa. Surgeons had a higher social status than barbers who were usually not educated, but were always of a lower rank than physicians¹⁴.

Physicians and surgeons also had a different job description. Physicians were obliged to visit the patient, make a diagnosis, and prescribe medication which the patient should get from the pharmacy. This most commonly included clinical observation, checking the patient's pulse, and in some occasions urine analysis. After the diagnosis was made, the physician gave instructions to the surgeon who performed harder practical procedures, most commonly involving bloodletting, resetting broken bones and sprained joints, wound bandaging, and the incision of buboes, and pus²⁶. The only known anesthetic of the time was alcohol, and bleeding was treated with cauterization (burning of surrounding tissue) as well as vein ligation³¹.

To treat the disease, since the early 14th century they often used various written material in form of summary works (usually with added commentaries), works on practical medicine, various terminological guides, instructions for special techniques (especially for surgeons), color charts for urine inspection, the opinions of renowned physicians on individual cases (*consilia*), and calendars and figures in cases when astrological medicine was used³². These works were read either in their original or simplified version, depending on the medical practitioner's status and education level. Physicians mostly read lengthier Latin versions of the texts, while surgeons used vernacular works with a more practical value. Some of these works have also been found in the monastery library of the Dominican monastery in Dubrovnik, which was severely damaged in the great earthquake of 1667. The works were written in Latin, Italian, French, German and Croatian languages, and dealt with internal and cerebral medicine, with orthopedics, surgery, ophthalmology, psychology, gerontology and gynecology³³.

Ragusan barber (*barberius*, *barbitonsor*) enjoyed a lower rank than the surgeon. Such medics considered medicine to be a craft or trade which was taught by an older, talented or experienced master. They performed mostly vulgar or simple surgical procedures which included autopsy, enemas, venesections, tooth extractions, bone setting, and bandaging wound infections. They also removed moles, lumps and blisters, and provided shaving, sewing, and wig-making services²⁶. Barber confraternities, which accepted only barber-surgeons, were formed and in the second half of the 18th century even fought against the arrival of barbers who only knew how to sew and make wigs²⁵. While barbers, unlike surgeons, were mostly uneducated people of local descent, their professions were very similar. Thus both surgeons and barbers often performed the same or similar medical procedures (bloodletting, bone setting etc.) and were asked to testify in court.

Another type of a medics were pharmacists. They collected medicinal herbs, crafted types of salves, ointments, tonics, and medicine, and sold them. The first pharmacists in Dubrovnik were often physicians at the same time. In order to prevent a conflict of interest between physicians and pharmacists, pharmacy was separated from health care by Fridrich II's edict in the 13th century. Pharmacy therefore became a separate institution that was in charge of running pharmacies and preparing medication. Pharmacists were called *speciarius* or *aromatarius* (Ragusan called them *spičari*), and were mentioned in the Statute of the City of Dubrovnik where they are called »herb merchants«⁹. Although the work of pharmacists became separate from the work of physics and surgeons, in the 14th century there are still Ragusan government regulations which permit physicians to administer their own medication, bandages, salves, ointments, and healing waters (*omnes emplastro, unguente, aquas et omnes medicinas ad artem zerugie pertinentes*)²⁶ to all citizens of Ragusa free of charge. In 1331, the Small Council decided that no municipal physician or surgeon should affiliate with a pharmacist under the threat of loss of his annual salary. The Small Council mentions the pharmacy service again in 1367 when it searches for a pharmacist who would be an educated herbalist, who would keep a well-equipped pharmacy, and would not affiliate himself with a physician²⁷. The pharmacist they employed was Bonaventura, an ex-trader from Zadar. He is the first pharmacist who way employed Ragusan in this way. Therefore, Ragusan councils understood the need for well-supplied pharmacies, and their link with citizen health care maintenance.

The oldest pharmacy in this area, the *aromatarium* most likely founded in 1317, is a small pharmacy of Friars Minor in Dubrovnik, which still exists today. This makes it one of the oldest European pharmacies in permanent use. At first, the pharmacy had the role of a monastic pharmacy and administered medication only to sick Franciscans in accordance with Head VI of the internal rules of Friars Minor. But over time, it began to issue medications for the people of Dubrovnik, and gradually became a public pharmacy. Unfortunately, there is not a lot of archive data about the early period of the pharmacy because the monastery suffered a great deal of damage in the earthquake that struck Dubrovnik in 1667, when its archive and library burnt down³⁴. It should be noted that the opening of the pharmacy to Ragusan people was not the result of pure humanitarianism since the Order of Friars

Minor financed itself, and by expanding its activities to the people of Dubrovnik, it also expanded its source of revenue³⁵.

In fact, medical prescription was not always a matter of medical and pharmaceutical theory, but of economics as well. While the treatment of diseases with local herbs and remedies was common practice in the community (and was administered to the people), on some occasion those of higher status were prescribed more luxurious medication. The prescriptions for ordinary patients included cheap ingredients, whereas gold and precious stones were prescribed for the rich³². Another important Ragusan pharmacy was Domus Christi, which according to traditional sources, was founded in 1420 within the Domus Christi hospital and worked as a state institution¹⁹.

Conclusion

Medieval Dubrovnik developed an excellent level of health care culture by introducing a large number of decisions, measures, and regulations on disease protection. With constant work on improving hygiene and health conditions, Dubrovnik tried to counteract the negative impact of illnesses which included both large-scale diseases, such as the plague or leprosy, and common diseases which emerged in the everyday lives of its citizens. Dubrovnik tried to solve its medical issues in a practical way, primarily by attracting educated physicians from abroad; by inventing and carrying out quarantine containment; and by introducing strict supervision over the implementation of hygienic and public health measures. Although Venice played a significant role in the development of Mediterranean medicine, Ragusa, as an independent state, preserved the specific features of its medical practice and had a certain influence on the cities located on the western Adriatic coast, and in its hinterland. The specific features of Ragusan medicine are apparent in its efforts to improve the hygienic living conditions of its people, especially with the construction of sewerage, water supply systems and road pavement; the invention of quarantine and employment of state health care officials from the ranks of nobility to supervise the implementation of said quarantine; and the employing of trained medical practitioners from abroad to treat the population of the city. Thus, the merchant and naval power of Dubrovnik developed a recognizable public health care identity in the context of medieval medicine.

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RAZVOJ DUBROVAČKOG ZDRAVSTVA OD 14. DO 16. STOLJEĆA – POSEBNOSTI DUBROVAČKE MEDICINE

SAŽETAK

Na istočnoj obali Jadrana razvio se grad Dubrovnik koji je postao velika trgovačka i pomorska sila, posebice od 14. stoljeća nadalje. Iako je grad bio ekonomski razvijen, pomorska trgovina s Istokom i sa zaleđe sa sobom je donosila velik rizik od epidemija različitih bolesti. Kako bi očuvao svoj trgovački prosperitet, identitet i postojanje, Dubrovnik uvodi razne mjere preventivne medicine od kojih je najpoznatiji izum karantene. Različit raspon ljudi, od dubrovačke vlastele preko posebnih službenik do školovanih liječnika, brinuli su se za zdravlje stanovništva bez kojeg bi Dubrovnik izgubio status moćne trgovačke sile kojega je tada imao. Uvodeći propise koji su se odnosili na higijenu i medicinu, bio je u rangu najrazvijenijih europskih gradova pri tome zadržavajući prepoznatljivost i posebnost svoje medicine.