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DERLEME MAKALESİ / REVIEW ARTICLE

# HISTORICAL TRANSFORMATION OF DIAGNOSIS AND MEDICAL COSMOLOGIES*

# TANI SÜRECİNİN TARİHSEL DÖNÜŞÜMÜ VE TIBBİ KOZMOLOJİLER

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**ABSTRACT**

The changes that medicine has undergone throughout history have led to various transformations in the diagnosis process. The effect of metaphysical elements was seen in the diagnosis process in Antiquity and the Middle Ages. After the Renaissance, the diagnosis process took on a more systematic character. The values of each age affected the diagnosis process. In ancient times, there was a symptom-based approach in the diagnosis process and symptoms were sometimes associated with metaphysical elements. The diagnostic techniques used in Antiquity reflect class differences. Some diagnostic techniques of this period were the source of the techniques used today. The understanding of Christianity in the Middle Ages had interrupted the diagnosis and treatment process until the Renaissance. The Renaissance was an important period in shaping the philosophical foundations of medical science. Today, the diagnosis process is more systematic and mechanistic. The understanding of each era is associated with medical cosmology. In the study, the diagnosis process is examined historically and the diagnosis process of the 18th century and beyond is discussed in the context of medical cosmologies.

**Keywords:** History of Diagnosis, Medical Cosmologies, History of Medicine.

**JEL Classification Codes:** I19, Z00, Y90.

**ÖZ**

Tıbbın tarih boyunca geçirdiği değişimler tanı sürecinde çeşitli dönüşümlere neden olmuştur. İlkçağ ve Ortaçağ'da tanı sürecinde metafizik unsurların etkisi görülmektedir. Rönesans sonrası ise tanı süreci daha sistematik bir karaktere bürünmüştür. Her bir çağın değerleri tanı sürecini etkilemiştir. İlkçağ'da tanı sürecinde semptom temelli bir yaklaşım bulunmaktadır. Semptomlar ise kimi zaman metafizik unsurlarla ilişkili görülmüştür. Ayrıca İlkçağ 'da kullanılan tanı teknikleri sınıfsal farklılıklar gösterdiği bilinmektedir. Bu dönemin bazı tanı teknikleri günümüzde kullanılan tekniklere kaynaklık etmiştir. Ortaçağ'ın Hristiyanlık anlayışı ise tanı ve tedavi sürecini Rönesans'a kadar sekteye uğratmıştır. Tıp biliminin felsefi temellerinin şekillenmesinde Rönesans'ın önemli bir dönem olduğu bilinmektedir. Günümüzde tanı süreci ise daha sistematik ve mekaniktir. Her dönemin anlayışı tıbbi kozmolojisi ile ilişkilidir. Bu çalışmada tanı süreci tarihsel olarak incelenmiş ve 18. yüzyıl ve sonrası ise tanı süreci tıbbi kozmolojiler bağlamında ele alınmıştır.

**Anahtar Kelimeler:** Tanı Tarihi, Tıbbi Kozmolojiler, Tıp Tarihi.

**JEL Classification Codes:** I19, Z00, Y90.

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## GENİŞLETİLMİŞ ÖZET

**Amaç ve Kapsam:**

Bu çalışmanın amacı tanı sürecini tarihsel düzlemde ele almak ve tıbbın tarihi boyunca tercih edilen tanı metotlarının ve araçlarını incelemektir. Söz konusu alanlarda yaşanan değişimler tarihsel akışta ele alınmış ve tıbbi kozmolojiler bağlamında incelenmiştir.

**Yöntem:**

Bu çalışmada tanı sürecinin tarihsel dönüşümü İlkçağ, Ortaçağ ve Rönesans sonrası olmak üzere üç başlıkta incelenmiştir. Tıp tarihi disiplininde yer alan çalışmalar ağırlıklı olmak üzere alan yazın taranmış ve sürece ilişkin bilgiler aktarılmıştır.

**Bulgular:**

Tanı süreci tarihsel olarak çeşitli dönüşümler yaşamıştır. İlkçağ'da, Mısır medeniyetinde belli hastalıkların ayırt edilebildiği, Hitit uygarlıklarında semptom temelli bir tanı sürecinin benimsendiği, Eski Çin tıbbında vücut dengesini ön plana çıkaran bir anlayış olduğu görülmektedir. Hipokrat'ın ise vücut sıvılarını ve somut belirtileri inceleme nesnesi olarak ele aldığı bilinmektedir. Mezopotamya uygarlıklarında günümüzde hala geçerliliğini koruyan palpasyon ve oskültasyon teknikleri kullanılmıştır. Ancak bu dönemde tanı sürecinde kullanılan tekniklerin toplumsal sınıflara göre değişkenlik gösterdiği belirtilmektedir. Örneğin alt ve orta sınıfa mensup kişilere tanı koymada - bir koyunun tanrı heykeli önünde kurban edilip karaciğerinin çeşitli malformasyonlar açısından incelenmesi- gibi inanç temelli uygulamaların tercih edildiği görülmektedir. Ortaçağ'a gelindiğinde inanç temelli uygulamalar tanı ve tedaviyi şekillendirmede ön plana çıkmıştır. Tanı ve tedavi sürecindeki gelişmeler bu çağda bir süre sekteye uğramıştır. Hastalıkların tanrı tarafından itaat eksikliği nedeniyle verilen bir ceza olduğu inancının güçlenmesi ve Hristiyanlık inancının basit işlemler haricinde kalan birçok cerrahi uygulamayı yasaklaması bu duruma zemin hazırlamıştır. Tanı sürecinde hastanın vücut sıvılarına -özellikle de idrarına- verilen önem bu dönemde de devam etmiştir. Öyle ki hastanın süslü şişeler içinde getirdiği idrarı incelemeyi reddeden bir hekimin dönemin yasası uyarınca dövülmeye maruz kaldığı belirtilmiştir. Bu dönemde üroskopinin gelişiminin yanında, rüya ve kehanete dayandırılan metafizik uygulamalar da tanı sürecinde tercih edilmiştir. Rönesans'la beraber yetişen bilim insanlarının dogmalara karşı çıkması ile tanı sürecinde gelişmeler hızlanmıştır. Kan dolaşımı teorisinin ortaya atılması, maden kaynaklı kimyasal birleşimlerin kullanımı bu dönemde yaşanan önemli gelişmelerdir. 16. ve 17. Yüzyılda epidemiyoloji, fizyopatoloji ve kimyanın tıp bilimine uyarlanması, Decartes'ın başı çektiği düalizm felsefesi ile ruh ve bedenin birbirinden ayrı olarak ele alınması ve böylece diseksiyonun gelişim göstermesi, 17. ve 18. yüzyılda botanik biliminde ilham alınarak hastalıkların sınıflandırılmaya çalışılması, bulaşıcı hastalıkların nozolojinin gelişimine ortam hazırlaması, mikroskop gibi araçların icadı tanı ve dolayısıyla tedavi sürecinin gelişimini sağlayan hususlardır. 18. ve 19. yüzyıllar ise steteskop gibi tanı araçlarının gelişimi ile tanı sürecinin başka bir boyuta taşındığı dönemlerdir. Buna ek olarak hastalığın bürokratik bir boyut kazanması ile 18.yüzyılda nozoloji alanındaki çalışmaları artış göstermiş ve bu çalışmalar 19. yüzyılın tanıları sınıflandırmayı hedefleyen çıktılarını büyük ölçüde etkilemiştir. Bu yüzyılda X ışınlarının tanı sürecinde kullanımına imkân sağlayan gelişmelerle, tanı daha somut kanıtlara dayandırılmış ve hekimin teknik uzmanlık gücünü önemli ölçüde artmıştır. 20. yüzyıla gelindiğinde tıbbın temel görevi tanı koyma olarak görülmüştür. Tanı ve prognozda elde edilen başarılar tıp biliminin zaferi olarak addedilmiştir. Yüksek teknoloji kullanımı süreci daha kesin ama daha mekanik bir hale getirmiştir. Tanı sürecinde yaşanan bu gelişmelerin tıbbi kozmolojiler bağlamında incelenmesi süreçte yaşanan değişimlere sistematik bir bakış sağlamaktadır. Çünkü tıbbi kozmolojiler tıbbi bilginin üretimini çerçeveleyen tüm etkileşim biçimlerini içermektedir. Kozmolojinin paradigmaya benzerlik gösteren bir kavram olarak görülmesine rağmen kozmolojiler daha yavaş değişim göstermekte ve hem teori hem de pratiği kapsamına almaktadır. Bu nedenle değişim süreçlerini dönemin tıbbi kozmolojisi kapsamında incelemek önem arz etmektedir. Alan yazında ilk olarak üç farklı üretim tarzının yansıtan üç tür kozmolojiden bahsedilmiştir. Bunlar yatak yanı tıbbı, hastane tıbbı ve laboratuvar tıbbıdır. Yatak yanı tıbbı hastanın isteklerinin süreci şekillendirdiği döneme işaret ederken, hastane tıbbı ise tıbbın profesyonel kariyer kapsamına alındığı, hastanın vaka olarak konumlandığı, tıbbın hastane kapsamında sürdürülen bir faaliyet alanı olarak mekansallaştırıldığı ve hekimin uzmanlık gücünün arttığı dönemdir. Bir diğer kozmoloji olarak ifade edilen laboratuvar tıbbı dönemi hastalığın salt biyokimyasal süreçlere indirgendiği ve bilim insanlarının sürece yönelik etkinliğinin arttığı bir dönemdir. Yatak başı tıbbında yargılar, hastane tıbbında muayene, laboratuvar tıbbında ise mikroskobik inceleme ve testler temel tanı tekniğidir. Bunlara daha sonra farklı kozmolojiler de eklenmiştir. Gözetim tıbbı kozmolojisi hastalıkların haritalanmasını ve nüfusun gözetimini içeren yirminci yüzyıl kozmolojisi olarak ifade edilmiştir. İnternet tıbbı kozmolojisi olarak ifade edilen bir diğer kozmoloji tıbbi bilginin iletişim teknolojileri aracılığı ile dönüşümünü ve bilgiyi algılama biçimlerimizi kapsamaktadır. Son dönemlerde ise batı tıbbının mevcut sorunlarını çözmenin yolunun yeni bir tıbbi kozmoloji ile mümkün olduğunu vurgulamaktadır. Özellikle dijital sağlık platformlarının yeni bir kozmoloji yarattığı üzerinde durulmaktadır.

**Sonuç ve Tartışma:**

Alan yazın incelemesi sonucu tanı koyma sürecinde kullanılan metot ve araçların tarihsel olarak farklılıklar arz ettiği görülmektedir. Tüm bu değişimlerin çeşitliliğine rağmen hem tanı araçlarında hem de metotlardaki dönüşümler kozmolojilerden bağımsız değildir. Her bir çağın perspektifini yansıtan kozmolojisi, tanıya bakışı ve tanıya yönelik uygulamaları şekillendirmiştir. Çalışmanın alan yazına tanı süreci ve kozmolojiler noktasında farklı bir bakış açısı sunarak katkı sağlayacağı düşünülmektedir.

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## 1. INTRODUCTION

The effort to determine the cause of pain with the motive of saving the sufferer from his helplessness has existed in different forms throughout the history of humanity. Today, this effort, which is mainly framed within the field of medicine, is included in the scope of "diagnosis" as the ability to form a judgment about the character of the disease. Although the diagnosis process of the physician in the modern world includes the support of current knowledge and skills with various technical tools, it is known that current diagnosis and treatment practices arise from the cumulative knowledge of the field of medicine. In this sense, it is difficult to say that diagnosis and treatment have an existence free from the past. As medical historian Waller puts it, we can also gain valuable insight from history about why things go wrong in medical science. The purpose of this study is to contribute to increasing this insight. In this respect, first of all, the diagnosis process will be discussed historically, and then periodical paradigm changes will be examined within the scope of medical cosmologies.

## 2. HISTORICAL TRANSFORMATION OF DIAGNOSIS

### 2.1. Diagnosis Process in Antiquity

The history of medicine is as old as the history of humanity. Archaeological remains and cave drawings provide a source of information obtained from the periods before the invention of writing. The oldest written source about the history of medicine is from 3000 BC, and is known to date back to the Sumerians, one of the oldest known civilizations (Budak, 2021, p. 6). The examination of ancient medical texts reveal that some diseases could be distinguished in Ancient Egypt, physicians in Hittite civilization catalogued diseases according to their symptoms, the philosophy based on the balance of yin and yang and the practice of medicine were integrated in Ancient China, and disease symptoms and definitions such as inflammation were made in the Roman period. Hippocratic school physicians, on the other hand, sought to detect changes in the body, such as blood and bile, to diagnose the disease (Sarı, 2007, pp. 35-36). Hippocrates' advocacy of a diagnostic protocol that included examining the patient's urine, auscultation of the lungs, and taking into account skin color and other visible elements, in other words, encouraging the use of the senses and mind as diagnostic tools played an important role in his being called the "Father of Medicine" (Berger, 1999, p. 28). Despite emphasizing the value of somatic cues and observation during this period, the focus was on predicting the outcome of a disease rather than making a diagnosis. A physician's reputation was determined by his having the right prognostic skills to predict who would recover and who would die, or how long an illness would last (Rakel, 2018).

In ancient Egypt and Mesopotamia, for diagnostic and therapeutic purposes, the earliest physicians relied primarily on the observation of clinical symptoms and used techniques such as palpation and auscultation. It is known that these techniques were generally used for the upper classes, and traditional and belief-based methods were preferred for the diagnosis of the middle and lower classes. For example, in diagnosing the diseases of middle and lower-class people; it is stated that methods such as the sacrifice of a sheep in front of a god statue and the examination of its liver in terms of various malformations and later the determination of the fate of the patient accordingly were used (Berger, 1999, p. 28). This shows that there were class differences between the methods preferred in the diagnosis process at that time. Although this period generally provides the basic information that can be a source for today's diagnostic practices - the diagnostic methods of Hippocrates - it is possible to say that the dominant belief system of the period had a significant impact on the methods used in the diagnosis process. As a matter of fact, due to the dogmatic structure of the Middle Ages, there was an increase in faith-based practices in every field, and the field of medicine also took its share of this situation.

### 2.2. Diagnosis Process in the Middle Ages

In the Middle Ages, medical practices and physicians had a largely religious tendency (Demirhan Erdemir 2014, p. 220). In medieval Europe, early Christians believed that illness was the result of punishment for sin and therefore, diagnosis was not perceived as a major necessity (Berger, 1999, p. 29). In this age, the discipline of the body was the aim of religions. An instance of this can be seen in the etymology of the word ‘pain’ and its root word ‘poena’, which means punishment. This suggests the idea that pain and illness were a punishment arising from lack of obedience to God at that time (Porter, 2009, p. 93). For this reason, it is known that everything, except for simple surgical procedures such as bloodletting, amputation, and tooth extraction, was prohibited due to the Christian belief of the Middle Ages. In this era, diagnostic methods included fever, pulse, sweat, stool, semen, and urine control. The urine taken from the patient was evaluated by the physician according to its color, smell, and

residue, and a diagnosis of the diseases was attempted. (Hot, 2007, p. 71). In this period, uroscopy became so widespread that the decorative urine bottles that the patients carried to the physicians in wicker baskets became the emblem of the medicine of this age. By 900 AD, physician and philosopher Isaac Judaeus had developed guidelines for the use of urine as an aid to diagnosis. Such a diagnostic method is so important that according to the Jerusalem Act of 1090, a physician who did not examine urine is reported to be beaten in public. The first book detailing the color, density, quality, and residue found in urine was also written around this time. Around 1300 AD, uroscopy became more and more common, reaching almost universality. In addition to uroscopy, the interpretation of dreams was also among the diagnostic methods of medieval medicine (Berger, 1999, p. 29). It is seen that the diagnostic practices in these periods were quite different from modern medicine, which adopted the Cartesian philosophy to a large extent. However, information about the physiological or pathological rationale underlying pulse and urine analysis is difficult to find in Early Medieval texts. These methods are similar to the forms of intuition, judgment, revelation, and prophecy that operate outside the logic of causality (Wallis, 2000, p. 265). Although it is desired that the methods used in diagnosing diseases, as well as in the treatment, are observable, it can be said that the process was generally associated with metaphysical elements.

### 2.3. Post-Renaissance Diagnosis Process

With the Renaissance, significant changes in the diagnosis and treatment process took place thanks to Versalius' opposition to dogmas in medicine, Paracelsus's critical approach to current treatments, and his use of chemical contents including sulfur and iron which were known to be minerals, and W. Harvey's theory of blood circulation, and the beginning of the use of microscopes-(Altıntaş, 2007, p. 92-96). While the rebirth of medicine and surgery corresponds to the 16th century, the 17th century is the period when new expansions were brought in botany and anatomy. In addition, the adaptation of epidemiology, physiopathology, and chemistry to medical science emerged in the 16th century but continued in the 17th century (Ülman, 2007, p. 99). In this century, the idea that nature has vitality, consciousness, will, and purpose, which comes from ancient times and is based on Aristotle, has been abandoned. Instead, with the philosophy of dualism led by Hobbes and Descartes, the soul and body were handled separately from each other, thus dissection developed. A healthy person is likened to a well-oiled, well-running machine, and disease has been described as a mechanical problem caused by clogging, lack of fuel, or excessive friction (Porter, 2009, p. 95).

The descriptive studies of the body structure and function of the 17th century laid the groundwork for the subsequent medical developments in diagnosis and treatment in the next century (Berger, 1999, p. 30). According to Rakel (2018), one of the greatest advances in diagnosis is the invention of the compound microscope towards the end of the 16th century, the microscope in the early 17th century, and the recognition of bacteria and blood cells with the use of microscopes in biological sciences thanks to their use for diagnostic purposes. In parallel with these developments, important breakthroughs have been experienced in nosology, which is defined as the science of disease classification. In the 17th century, Sydenham introduced the idea of classifying all diseases by species, just as botanists did with plants (Walker, 1990, p. 5). Epidemics of acute infectious diseases, such as those that struck thousands of people suddenly in the 18th and 19th centuries and left them at the same speed, provided the ideal environment for the development of modern nosological concepts.

Sauvages published a book in 1731 in which he grouped diseases into classes, orders, and genera, just as biologists did with plants and animals. Later, in his book titled Philosophy of Nosology, published in 1798, Pinel emphasized the importance of reaching the typical picture of a disease by taking into account the changing picture in each patient. He defined 2700 diseases and divided them into classes, orders, genera, and species (Walker, 1990, p. 8-9). The classification of disease Laennec devised was based on identifiable changes or 'lesions' in the three components of the human organism, which he categorized as solids (organs), fluids, and the life principle. The classification aimed to be able to diagnose the disease by objectively identifying the associated 'lesion' regardless of its location in organs, fluids, or vital principles. With these developments, the necessity of applying contemporary experimental studies in chemistry, physics, and physiology to clinical medicine has emerged in the diagnostic process (Duffin, 1986, p. 195). The fact that Walker (1990) states that modern nosology begins with Laennec is an emphasis on the transformative effect of his work. A basic classification system introduced at the end of the 18th century and the use of nosology are two important cornerstones in the historical transformation of the diagnostic process. In the following centuries, in order to establish nosology, technical developments and discoveries in the field of diagnosis followed with the International Classification of Diseases (ICD) (Armstong, 2011, p. 801). In other words, the studies of the 18th century in the field of nosology greatly influenced the outputs of the 19th century aimed at classifying

diagnoses. Some historians have viewed the explosion of natural history and medical classifications in the late 19th century as both a political force and a regulatory rubric for complex bureaucracies (Bowker & Star, 1999, p. 5). In a way, this century is a period when physicians direct their attention not to the sick individuals but to the diseases their bodies carry, thus "the sick man disappears" (Porter, 2009, p. 96). In addition to these studies focusing on the classification of diseases, the discovery of percussion by Auenbrugger in 1760 and its spread by Corvisart in 1808 are important developments that are accepted as the real beginning of physical diagnosis (Walker, 1990, p. 5).

In the 18th and 19th centuries, physicians often saw patients in their own homes surrounded by their families. These patients are typically known to be wealthy and well-educated. During long bedside interviews, patients presented descriptions of their symptoms that formed the basis of the physician's diagnosis. Then, in 1816, French doctor René Laennec rolled a few papers into a tube to diagnose a young woman's heart condition when traditional percussion was not possible because of the patient's obesity, and surprisingly, he heard the patient's heartbeats ed much louder and more clearly with his proto-stethoscope. He began experimenting with other "mediated auscultation" instruments. Thus, the relationship between the doctor and the patient, has changed over time with the formerly "talkative" patient remaining silent and following the doctor's instructions, and physiological signs have become the main source of diagnostic information. This transformation is not a simple addition of more data, but a shift from "bedside medicine" to "hospital medicine" in medical paradigms – which will be detailed in the next section – (Jewson 1976 as cited in Schubert, 2011, p. 853). In this sense, it can be said that Laennec invented the stethoscope and initiated a century of explosive developments in physical diagnosis (Walker, 1990, p. 5). In essence, auscultation with the bare ear has been accepted as one of the most important developments in the history of medicine. When it was understood that the heart and lungs had unique sounds and that these sounds were sometimes functional in diagnosis, physicians began to auscultate by placing their ears on the heart, chest, and back. In the words of Thomas, "it is difficult to imagine a friendlier human behavior and a more sincere expression of personal interest and compassion than a friendly head bent towards the patient resting on the torso." However, although the invented stethoscope significantly improved the possibility of auscultating to the sounds in the chest area, it distanced the physician from the patient to a certain extent, and the stethoscope is the first of the new technologies that will increase the distance between the physician and the patient (Thomas, 2008, p. 57). Typically, this story is told as one of the reasons for the growing distance between physician and patient, with the stethoscope effectively creating a barrier between the two. However, the reverse is also possible: the introduction of the stethoscope then unites the physician's and patient's bodies as a new diagnostic ensemble. On the other hand, it creates distance by creating new aspects of medical knowledge that are no longer discussed in physician-patient dialogues. Diagnostic tools later became a professional control tool and the focal point of the asymmetry between the physician and the patient. (Schubert, 2011, p. 853). For this reason, it can be said that the use of tools in the diagnosis process is an important breaking point. The stethoscope, as the first instrument that came between the physician and the patient, paved the way for medical devices to mediate the relationship between the physician and the patient in the following periods. However, as Reiser (1978) points out, it would be too simplistic to technically conceptualize bedside medicine as non-technical and modern medicine based only on the invention of a diagnostic tool. Point-of-care medicine may not have practiced a multitude of tools but is known to be familiar with a wide variety of techniques such as early verbal and visual techniques and later the adoption of manual techniques. In particular, manual techniques have shifted the focus of the physician's exploratory actions to the physical examination rather than the patient's oral narratives. The feature of the stethoscope is that it is an element that strengthens this transition with its launch (Schubert, 2011, p. 853).

According to Rakel (2018), another important diagnostic tool developed in the 19th century is the ophthalmoscope, an instrument that examines the inside of the eye, developed in 1850 by the German scientist and philosopher Hermann von Helmholtz, known for his knowledge of physics and mathematics. This tool was able to provide information about eye diseases as well as cardiovascular abnormalities and complications of diabetes mellitus. Invented by the German physicist Daniel Fahrenheit in the 18th century, the use of the mercury thermometer in medicine as a clinical tool in the mid-19th century is another advance toward diagnosis. Perhaps, the greatest modern anatomical diagnostic tool is the X-ray, discovered in 1895 by German physicist Wilhelm Conrad Rontgen. These developments are proof that important advances were seen in medicine with the application of the results of natural sciences to medical uses at the end of the 19th century. As can be seen, clinical observation in this period focused on symptoms considered in the light of lesions rather than unexplained symptoms. The active examination has gained importance with new and dynamic diagnostic methods (Demirhan Erdemir 2014, p. 205).

At the end of this century, medical research has become more concerned with chronic degenerative disorders rather than focusing on the infectious diseases that once spread across continents. The reasons for this change are the control of communicable diseases to a large extent through vaccination and other public health activities, the changing of the perception of the disease, the transfer of the disease from home to the hospital, the prolongation of life expectancy with the causes of death becoming associated with chronic diseases. The developments in general scientific understanding of this period and technological developments enabled the examination of the disease. Unraveling the functioning of the endocrine system and the discovery of insulin, the use of X-rays for diagnosis, and an in-depth examination of the body with ECG and EEG as never before are among these developments (Duin & Sutcliffe, 1992, p. 86). This situation has significantly increased the technical expertise of the physician in the diagnosis process and has laid the groundwork for the dominant medical paradigm of the next century.

Physicians of the 20th century were increasingly empowered by their reputation for technical expertise and had to apply this expertise in practice (Crenner, 2002, p. 33). The main task of medicine was seen as diagnosis in the 1930s. Achievements in diagnosis and prognosis have been regarded as the triumph of medical science. So much so that in these years, the purpose of medical education programs was limited to teaching how to recognize, classify diseases disease symptoms, and their appearance in the laboratory, and how to diagnose them. The treatment of the disease formed a small part of the education programs (Thomas, 2008, p. 28-29). Thus, diagnosis has moved away from being an implicit element of the physician's independent search for disease and has become a visible and distinctly attractive service (Crenner, 200, p. 54). The increase in the use of high technology for diagnosis in the 1950s made the diagnosis in many cases much easier and more accurate, but also more mechanical and impersonal. Critics of this trend of standardization and mechanization argued that it led the physician to focus on measurable aspects of the illness at the expense of a more qualitative element, such as the patient's mental or emotional state. This criticism has increasingly grown since the resurgence of interest in holistic medicine (Duin & Sutcliffe, 1992, p. 168). These changes in the diagnosis process, together with the development of industrial capitalism and the increase in the number of both physicians and patients, transformed the role of the physician, and the physician of the modern age assumed a secular character (Demirhan Erdemir, 2014, p. 220).

## 3. MEDICAL COSMOLOGIES AND DIAGNOSIS IN THE 21ST CENTURY

Medical cosmologies were introduced by Jewson (2009) as fundamentally metaphysical attempts to systematically define and delimit the essential nature of medical discourse as a whole. Within these initiatives, medical cosmologies are conceptual structures that form the frame of reference in which all questions are asked, and all answers are presented. They include forms of relationships and social interaction that are outside the realms of social discourse but surround the production of medical knowledge. According to Greaves (2002), the concept of medical paradigm has been adopted more than the concept of medical cosmology. However, he also emphasized that paradigm and cosmology have some differences and built his work in this direction. Cosmology encompasses scientific and technical as well as moral and cultural issues and is used to refer to both theory and practice. Paradigm, on the other hand, focuses more on theory. In other words, cosmology has wider implications for diagnostic practice than paradigm. Also, cosmologies change much more slowly than paradigms. It has been suggested that there are two main periods in western medicine that can be associated with medical cosmologies since antiquity. These are humoral medicine (medicine in which diseases were associated with bodily fluids), which dominated from 200 AD (Galen's time) to 1600 AD, and biomedicine (medicine based on biology and physiology), which dominated after 1800 AD. Jewson (2009) mentions three types of cosmology in the production of medical knowledge, reflecting three different modes of production that successively dominated Western European societies between 1770 and 1870. These are bedside medicine, hospital medicine, and laboratory medicine.

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**Table 1.** Three Modes of Production of Medical Knowledge

| | Patron | Occupational role of Medical Investigator | Source of Patronage | Perception of Sick-man | Occupational Task of Medical Investigator | Conceptualization of Illness |
|---|---|---|---|---|---|---|
| Bedside medicine | Patient | Practitioner | Private Fees | Person | Prognosis and therapy | Total psychosomatic disturbance |
| Hospital medicine | State; hospital | Clinician | Professional career structure | Case | Diagnosis and classification | Organic leison |
| Laboratory medicine | State; academy | Scientist | Scientific career structure | Cell complex | Analysis and explanation | Biochemical process |

Source: (Jewson, 2009, p. 624).

Table 1 shows the three types of cosmology put forward by Jewson (2009) and their differences in the production process of medical knowledge. Bedside medicine is the period in which the patient and his wishes shape the process to a large extent, and wealthy people manage the process with private fees. The second cosmology adopted with the establishment of hospitals is hospital medicine. This cosmology involved the medical researcher in a professionally structured career field, the patient began to be perceived as a case, and diagnosis and classification became a priority, so the patient's patronage power shifted to the clinician. In Armstrong's (2008) words, the understanding of illness, which was spatialized by hospital medicine, continued to rise in the 20th century. The third cosmology, the laboratory medicine period, is a period in which the disease is reduced to purely biochemical processes, and the power of producing and transforming medical knowledge is in the hands of scientists. Armstrong included another cosmology, which he called surveillance medicine, to these three cosmologies. According to him, despite the clear hegemony of hospital medicine in the last two centuries, a new medicine based on the surveillance of the normal population began to emerge in the early twentieth century. Surveillance medicine includes remapping disease areas. In this cosmology, not only is the relationship between symptom, sign, and disease redrawn, but also the nature of the disease is reinterpreted. Finally, Nettleton and Burrows (2003) included internet medicine, which they called e-scaped medicine, in these cosmologies. He stated that power/knowledge relations are shaped as a result of the rise of informational knowledge and discursive knowledge. They emphasized that in this cosmology, medical information is transformed through information and communication technologies, and the information gathered in the decision-making process regarding the appropriateness of diagnosis and treatment shapes our perception and affects our degree of trust in medical practice. In the words of Nicolson (2009), medical knowledge in bedside medicine is exoteric. however, in the era of hospital and laboratory medicine, medical knowledge became esoteric. However, with the widespread use of the internet and self-help groups today, medical knowledge has become more common among ordinary (non-medical) people.

The change in the production and use of medical knowledge in each cosmology has undoubtedly changed the preferred diagnostic techniques. As Jewson (2009, p. 624) stated, there are important differences between cosmologies in terms of the techniques used in the diagnostic process. While qualitative judgment is accepted as the basic technique in bedside medicine, examination has gained importance in hospital medicine, and laboratory medicine has adopted microscopic examination and chemical tests as the basic diagnostic technique.

According to Greaves (2002), although the biopsychosocial paradigm deals with both human and scientific aspects of medicine, it cannot harmonize them. Therefore, he argues that the biopsychosocial paradigm is a revised and expanded version of the orthodox biomedical paradigm and emphasizes that the way to solve the current problems of western medicine is possible with a new medical cosmology.

Saukko (2018) argued that digital health platforms create a new cosmology today. In this new cosmology, data is created jointly by companies and consumers. In other words, companies providing genetic testing services and individuals receiving these services are co-creators of health information. It can be said that this is one of the features that distinguishes 21st-century cosmology from surveillance medicine. In addition, this created health information is open to revision by laypeople. With this feature, it differs from the cosmology of the period, which is expressed as laboratory medicine.

## 4. CONCLUSION

The diagnosis process has passed through various stages throughout the history of medicine. Antiquity is the period when diagnosis and treatment were greatly influenced by religious elements. This is not a situation that completely hinders the development of medicine. However, the diagnostic techniques of the period were affected by religious rituals, and class differences played a role. If religious elements did not hinder the development of medicine in Antiquity, the situation progressed differently in the Middle Ages. Christianity's harsh attitude towards surgery slowed down the development of this field in the Middle Ages. The examination of the patient's body fluids to diagnose the disease in Antiquity continued in the Middle Ages as well. With the Renaissance, scientific developments accelerated, thus innovations in diagnosis and treatment emerged. After the 20th century, the classification of diseases came to the fore. Medical knowledge advances cumulatively. When the stages of the diagnosis process are examined historically, there is a common aspect. The diagnosis process is not independent of the dominant paradigm of the period. It is medical cosmologies that form the framework of medical discourse because the social interactions of the period shape medical knowledge. For this reason, when the history of medicine is examined, the diagnosis process after the 18th century, which changed very rapidly, should be considered in the context of medical cosmologies. Generally, the diagnosis process is included in the history of medical studies. However, the diagnostic process is a special process that should be examined independently of the treatment because the realization and visibility of the illness are possible with the diagnosis of a disease. A historical examination of the diagnostic process will provide insight into actions in the medical field. The purpose of viewing the diagnostic process in a historical dimension is not to belittle the past, but to acknowledge the fact that, as Waller puts it, "medicine has always had to fight against convention, whimsy, and sometimes dangerous overconfidence." (Waller, 2008, p. 55). This study, which deals with the historical aspect of the diagnosis process, aims to contribute to raising awareness of this issue.

## DECLARATION OF THE AUTHORS

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