

The Use of Physical Exercise in the Hippocratic Corpus

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This thesis sets out to prove that the Hippocratic Corpus uses exercise prescriptions for the treatment of various pathologies, showing concordance with modern EIM (‘exercise is medicine’) principles. I provide an analysis of both the Hippocratic views on exercise and the prescriptions themselves from the following texts: *Regimen*, *Internal Affections*, and *Regimen in Acute Diseases*. The fundamental purpose of this research project is to study the origins of exercise therapy as a medical practice in the ancient world.

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Section 1: Understanding Exercise in the Hippocratic Period

1.1: Introduction

In this thesis, I explore the written evidence produced by the medical institution known as the Hippocratic School of Medicine, which I argue recognized physical exercise as a means to promote health and treat illnesses. More specifically, this research sets out to provide an extended examination of the evidence for the use of physical exercise in the field of Greek medicine during the Hippocratic Period (460-360 BCE), focusing on the written evidence that came out of the school known as the Hippocratic Corpus. The fundamental purpose of this research project is to study the origins of exercise therapy as a medical practice in the ancient world. The works of the Corpus that I have found to include exercise recommendations and/or prescriptions are: 1) *Regimen I-III*, 2) *Internal Affections*, and 3) *Regimen in Acute Diseases*. For this reason, these are the principal passages that will be analyzed in the most detail. Other works of the Corpus that help to explain the philosophy of exercise and health in Hippocratic medicine, have also been analyzed and discussed. This includes *Ancient Medicine*, *Air, Waters and Places*, and *Nature of Man*. This project also investigates how and why exercise was recommended and/or prescribed for this purpose (i.e. the purpose of health promotion, or exercise therapy) during this period. Finally, this investigation also considers the ancillary practices that were prescribed in conjunction with exercise (e.g. overall diet and recovery methods, dietetics, or *diaita*).

The reason for choosing to focus solely on this body of literature (the Corpus) is that it provides the earliest known examples of exercise recommendations and prescriptions in the history of Greek medical literature. The study of the evolution of the practice into the Hellenistic, Roman, and Late Antique Periods is not included in this work, though I hope the findings presented here serve as a basis for future study into these later periods.

In the last two decades, the fields of exercise science, kinesiology, medicine, and physiology have explored the concept of ‘exercise is medicine,’ in classical antiquity. However, these topics have not been given detailed, careful attention by the field of classical studies. In recent decades scholars have demonstrated, from a scientific standpoint, that ‘exercise is medicine,’ and detailed the various positive effects that exercise has on promoting health. In this thesis, I am applying this modern framework to the study of exercise and health in antiquity. I examine the means by which exercise came to be viewed and employed as a therapeutic method either to promote health or treat illnesses, and detail the prevailing cultural, philosophical/scientific, and medical views on this subject from the Pre-Hippocratic (650-460 BCE) to Hippocratic Periods (460-360 BCE). The varying beliefs concerning the potential positive and negative effects of certain exercise regimens within Hippocratic medicine will also be discussed. I hope that this study increases our understanding of the historical basis for the modern concept of ‘exercise is medicine,’ or EIM, improving implementation of EIM by demonstrating what worked for practitioners in Hippocratic medicine. The EIM initiative, which receives significant attention throughout this work, began in the field of medicine as an attempt to encourage evidence-based exercise programs within patient care (see section 1.2 below for an expanded definition and discussion of EIM).

1.2: Methodology and Terminology

To begin, I discuss the methodologies that I apply in this study and the associated terminology with consideration of the applicability of modern scientific theory to the ancient Greek context. I then undertake a critical review of the existing scholarship concerning physical exercise in the Hippocratic Corpus in section 1.3.

Methodology

I begin by summarizing my research methodologies taken to prove that exercise was used for the purpose of health promotion or exercise therapy within the Hippocratic School of Medicine, during the Hippocratic Period (460-360 BCE).¹ This analysis consists of selected passages from the body of work that has been canonized as the ‘Hippocratic Corpus.’ The Hippocratic Corpus (often referred to simply as the Corpus) is the name given to this compendium of literature written by the doctor-authors of the Hippocratic School, which is the largest surviving body of early Greek prose.

My analysis has been carried out using a multi-disciplinary approach, drawing on multiple sub-disciplines of classical studies, as well as some disciplines outside of the field. Modern EIM approaches have never been applied to these texts within classical studies, yet the modern data on physical exercise promises to increase our understanding of how exercise was used as medicine in Greek antiquity. These secondary sources also provide the modern data on physical exercise in medicine, which allows for a greater understanding of the effectiveness of

¹ I will henceforth continue to use the term ‘Hippocratic School of Medicine,’ when necessary, to refer to the collective of doctors responsible for authoring the body of literature known as the ‘Hippocratic Corpus.’ The purpose of this is to provide a practical label for use when referring to the institution responsible for producing the texts under consideration in this thesis.

the Hippocratic prescriptions, and for a means to properly situate my findings in a modern context. Consultation of primary and secondary sources outside of the Hippocratic Corpus (i.e. history and epigraphy) is due to the need to display the evolution of medicine, situate my findings in the context of the ancient Greek world, and compare the Hippocratic ideas on exercise with contemporary philosophical/scientific thought.

The passages selected for my analysis were chosen based on the sole criterion that they include recommendations and/or prescriptions for physical exercise as a means to either promote health or treat illnesses, according to the criteria of modern EIM. Those passages found to demonstrate proof of my argument come from the following works: 1) *Regimen I-III*, 2) *Internal Affections* and 3) *Regimen in Acute Diseases*. Section 3 of this work ('The Use of Exercise in the Hippocratic Corpus') analyzes in detail selected passages from these texts.

Texts

Unless otherwise specified, all Greek texts and accompanying English translations cited in my analyses come from the Loeb volumes. Joly and Littré have been used for intertextual analysis.

Internal Affections: Littré 7 (1851), 162-303; Loeb 6 (Potter, 1988b).

Regimen: Littré 6 (1849), 462-663; Loeb 4 (Jones, 1931); CMG (Corpus Medicorum Graecorum)

1. 2. 4 (Joly and Byl, 1984); CUF (Les Classiques Universitaires de France) 6.1 (Joly, 1967).

Regimen in Acute Diseases: Littré 2 (1840), *Acut.* A 192-377; Loeb 2 (Jones, 1923b) *Acut.* A. and Loeb 6 (Potter, 1988b); CUF 6.2 (Joly, 1972/2003).

Periodization

Pre-Hippocratic Period: I have chosen to use this periodization when referring to any content/material related to the history of medicine between 650-460 BCE, which roughly

corresponds to the Archaic Period. I have done so to align with the chronology preferred by EIM-based publications.

Hippocratic Period (460-360 BCE): I have chosen to use this periodization when referring to any content/material related to the history of medicine between 460-360 BCE, which roughly corresponds to the Classical Period. I have done so to align with the chronology preferred by EIM-based publications.

Terminology

I now define and discuss the terms which are most crucial to understanding my argument: *health, health promotion, physical exercise*, and ‘*exercise is medicine*’. Today, the World Health Organization defines health as “a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity.”² Thus, health promotion, also according to the WHO, is defined as “the process of enabling people to increase control over, and to improve their health.”³ The CDC (Center for Disease Control) cites exercise classes as an example of a health promotion service.⁴ To avoid confusion, it should be noted that when using the term ‘health promotion’ in this paper, it is not in reference to the public, socio-political initiatives that may be taken to enable and educate individuals to take control of their health. Rather, we are often dealing simply with the concept of ‘promoting health’ for patients by prescribing exercise to maintain, improve, or optimize health.

Modern exercise physiologists have differentiated between the meaning of physical activity and physical exercise. Physical activity is currently defined as “any bodily movement

² "Constitution". *World Health Organization*.

³ *Health Promotion Glossary of Terms 2021*, Geneva: World Health Organization, 2021, p. 1

⁴ Centers for Disease Control and Prevention. (n.d.). Workplace Health Promotion. Centers for Disease Control and Prevention. <https://www.cdc.gov/workplace-health-promotion/php/index.html>

produced by skeletal muscles that results in caloric expenditure.”⁵ Physical exercise falls into the category of physical activity but is differentiated by the key point of purposefulness. More specifically, physical exercise is defined as “(purposeful) training undertaken to improve physical fitness.”⁶ There are many categories of attributes that exercise physiologists measure to assess physical fitness, including, but not necessarily limited to: 1. Cardiorespiratory endurance (aerobic fitness), 2. Skeletal muscle strength, 3. Skeletal muscle endurance, 4. Flexibility, and 5. Body composition.⁷ There is a multitude of different modes of physical exercise that human beings may pursue to improve physical fitness, for a vast number of different reasons, be it socio-cultural, sport-specific, or *health-specific*, as is the concern of this paper.

Physical exercise for the purpose of health promotion cannot be discussed in a modern context without discussing the ‘exercise is medicine’ (EIM) initiative. This initiative was launched in 2007 as a joint effort by the American College of Sports Medicine (ACSM) and the American Medical Association with the mission “to encourage physicians and other health care providers to include physical activity when designing treatment plans and to refer patients to evidence-based exercise programs and qualified exercise professionals.”⁸ The approach to exercise as a form of medicine in patient care has evolved to include many different types of exercise prescriptions. Exercise may now be prescribed either to help achieve optimal health and physical fitness for the patient, or to treat a specific clinical disease or pathology, with varying approaches.⁹ The health benefits of physical exercise have been well established in the medical literature, and the key benefits may be summarized as follows: 1) Reducing the risk of a primary

⁵ Ehrman, J.K., Gordon, P.M., Visich, P.S., and Keteyian, S.J. Ed. 2023:22. Definition is originally from Caspersen C.J., Powell K.E., Christenson G.M. 1985:126-130.

⁶ Ehrman, J.K. Et al. 2023:73.

⁷ Ehrman, J.K. Et Al. 2023:73 cites American College of Sports Medicine. 2011:1334-1359. Neuromuscular functioning (e.g., reaction time), balance control, physical functioning (e.g., assessments that relate to functional goals) may also be used, and the assessments are often tailored to context.

⁸ Ehrman, J.K. Et al. 2023:17.

⁹ Ehrman, J.K. Et al. 2023:73. Chapters 8-31 detail specific exercise prescriptions for individual pathologies.

or secondary chronic disease, 2) Improved cardiorespiratory and musculoskeletal fitness, 3) Improved metabolic, endocrine, and immune function, 4) Reduced all-cause mortality, 5) Reduced risk of cardiovascular disease, 6) Reduced risk of certain cancers (colon, breast), 7) Improved mood (anxiety and depression), 8) Reduced risk of obesity, 9) Overall improved health-related quality of life, 10) Reduced risk of falling, 11) Improved sleep patterns.¹⁰ Many of these benefits are demonstrably not only related to physical health, but also mental health, which is widely recognized in the literature.¹¹

The medical use of exercise in ancient Greece has caught the interest of medical scholars working to further the EIM ('exercise is medicine'). In the 2014 *Advances in Physiological Education*, Charles Tipton, professor of physiology from the University of Arizona, published a history of EIM.¹² This study found that Hippocrates, the founder of the Hippocratic School of Medicine, met the following criteria for EIM, as a physician who wrote exercise prescriptions: 1. Considering a patient's age, physical status, dietary habits, health status, etc. before prescribing exercise, 2. Teaching that exercise should be performed daily and in moderation, 3. Writing exercise prescriptions, 4. Believing overly strenuous exercise would result in disease and potential death, 5. Prescribing exercise for obese subjects, 6. Prescribing exercise for diseases besides obesity and diabetes, and 7. Advocating or prescribing exercise for its effects on growth and development, strength/endurance of muscles, improved digestion, cardiovascular system changes, elevated temperature, reduced fatigue, and enhanced physical appearance.¹³ Although

¹⁰ Ehrman, J.K. et al. 2023:74. Citing American College of Sports Medicine and the American Diabetes Association. 2010:2282-2300, Arem H, Moore S.C., Patel A. et al. 2015:959-967, Blair S.N., Kohl H.W III, Paffenbarger R.S. Jr., Clark D.G., Cooper K.H., Gibbons L.W. 1989:2395-2401, Paffenbarger R.S., Hyde R.T, Wing A.L., Hsieh C.C. 1986:605-613. Pollock M.L., Cureton T.K., Greninger L. 1969:70-74, and U.S. Department of Health and Human Services. 1996.

¹¹ For example, see Schuch F.B., Vancampfort D. 2021:177-184.

¹² †Charles Tipton, who passed away last year (2024). Tipton, C.M. 2014:109-117.

¹³ Tipton, C.M. 2014:111. See section 1.3 'The Hippocratic School and Corpus' for discussion on the accuracy of the term 'School', and for the authorship of the Corpus. I use the name of Hippocrates when the authors that I am citing have done so, rather than creating ambiguity. However, I am also careful not to ascribe authorship to Hippocrates where ambiguity of authorship exists when making my own conclusions.

Tipton recognizes several important criteria, my work goes beyond Tipton's conclusions in the following ways: 1. By detailing and analyzing the categories and types of exercises used in these exercise prescriptions from both the modern and Greek perspective, 2. By providing thorough commentary on individual examples of exercise and exercise prescriptions in the texts using the original Greek texts and considering exercise more broadly during the Hippocratic Period, 3. By relating and comparing these exercise prescriptions (exercise therapies) to those used in modern clinical exercise physiology, detailing and converting features of the prescriptions such as volume, intensity, and duration, and 4. By comparing the perceived physiological effects and benefits of these exercise prescriptions to modern clinical data (such as in comparing the Hippocratic prescription for kidney disease to modern exercise therapies used for chronic kidney disease).

In returning to my own argument, I now point to the Hippocratic work, *On Ancient Medicine*, in which this doctor-author explicitly demonstrates his own interest in the potential health benefits of gymnastic, physical exercise (in conjunction with diet):

ἔτι γοῦν καὶ νῦν οἱ τῶν γυμνασίων τε καὶ ἀσκησίων ἐπιμελόμενοι αἰεὶ τι προσεξευρίσκουσιν κατὰ τὴν αὐτὴν ὁδὸν ζητέοντες ὅ τι ἐσθίων τε καὶ πίνων ἐπικρατήσῃ τε αὐτοῦ μάλιστα [10] καὶ ἰσχυρότερος αὐτὸς ἑωυτοῦ ἔσται. καὶ νῦν οἱ τῶν γυμνασίων τε καὶ ἀσκησίων ἐπιμελόμενοι αἰεὶ τι προσεξευρίσκουσιν κατὰ τὴν αὐτὴν ὁδὸν ζητέοντες ὅ τι ἐσθίων τε καὶ πίνων ἐπικρατήσῃ τε αὐτοῦ μάλιστα καὶ ἰσχυρότερος αὐτὸς ἑωυτοῦ ἔσται.¹⁴

“At any rate even in the present day those who study gymnastics and athletic exercises are constantly making some fresh discovery by investigating on the same method what food and what drink are best assimilated and make a man grow stronger.”

¹⁴ *Ancient Medicine*, I.4. (Loeb I, 21).

What did this author mean by these types of exercise (οἱ τῶν γυμνασίων τε καὶ ἀσκησίων), how does this compare to the modern definition discussed above, and how are they used in the rest of the Corpus? To help answer these questions, I now summarize the Greek definitions of the terms in question, as they were understood in the periods of concern in this paper.

The Greek word for health (ὑγίεια) describes a condition of completeness and contentment. A healthy body was believed to be a well-balanced body, one that exists in harmony with cosmic laws and order.¹⁵ Before the sixth century BCE, the Greek view of health was intrinsically tied to the idea that disease was a result of divine retribution.¹⁶ The Greek word for disease (νόσος) used in this era has been interpreted literally to mean “without wellbeing”, or “without divine favour.”¹⁷ It should also be kept in mind that this idea of disease existed in a time when population health was exceptionally poor.¹⁸ There are no medical texts from this time, and most of our knowledge about medicine comes from the Homeric texts, with a roughly 250 year gap existing between Homer and the first complete medical texts.¹⁹ Doctors did exist in Greece, but these were mostly surgeons who would pray (invoke the gods) and treat wounds at the same time, known as ‘travelling doctors;’ and serving a much more limited function than the later Hippocratic doctors.²⁰

However, in the sixth century BCE, philosophical/scientific thought evolved and shifted drastically to encompass a more developed and complete understanding of health, with ideas

¹⁵ Tountas Y. 2009:186. Citing Ackerknecht, E.H. 1982.

¹⁶ For discussion of the prevailing views on disease in Greece pre-sixth century BCE see Chapter 1 and 2 in Fox, R.L. 2020.

¹⁷ Willi, A. 2008:161, and *Works and Days* 94-105.

¹⁸ The most complete picture of this comes from the skeletal evidence from the 7th century BCE site, Pydna, showing overall poor population health, especially spinal health. Triantaphyllou, S. 1999:353-64.

¹⁹ The Pre-Hippocratic period (650-480 BCE) produces some scarce, incomplete medical texts which are discussed below in section 2.1 ‘A New Worldview.’

²⁰ For travelling doctors see Dana, M. 2012: 249-266. And Nocita, M. 2012. This topic is discussed further in section 2.2 ‘The Hippocratic School and Corpus’.

much closer to those that would be held by the Hippocratic doctors in the latter half of the fifth century BCE. These new views understood health and the human body as being intrinsically a part of nature, or the natural world itself, as opposed to something that was susceptible to the wrath of the gods or divine punishment. To quote Robin Lane Fox, these new ideas “...helped relate healing and health to a general type of theorizing which had not been fully considered before. It enabled medicine to leave the Homeric world of random gods and demons to one side...the new idea of ‘nature’ put the human body, too, in a new light.”²¹

Health as defined in the Hippocratic Corpus is quite complex. The Hippocratic Corpus is the name given to the compendium of literature that came out of the Hippocratic School, possibly beginning with Hippocrates himself.²² By the time of Hippocrates, the physiocratic school of thought was established with the realization that “maintaining good health and fighting illness depends on natural causes and that health and disease cannot be dissociated from particular physical and social environments nor from human behavior. In this context, they defined health as a state of dynamic equilibrium between the internal and the external environment, they took under consideration the physical and social determinants of health, they empowered individuals and communities through new democratic and participatory institutions, they gave emphasis in health education and skill development, they recognized the importance of supportive environments and of healthy public policy and they re-oriented medicine toward a more naturalistic and humanistic perspective.”²³

The philosophical/scientific evolution of thought concerning nature “...became enmeshed in dialogue with medical beliefs about health and sickness.”²⁴ Thus, the Hippocratic

²¹ Fox, R.L. 2020:41.

²² See section 2.2.

²³ Tountas, Y. 2009:185.

²⁴ Tountas, Y. 2009:186.

understanding of health evolved along with philosophical/scientific thought. However, health is also more broadly defined outside of the Hippocratic context during this period by notable authors such as Plato and Xenophon. Although still understood in a medical context, with harmony in the body being essential for health, it was not a concept relegated strictly to a scientific or medical way of thought. Rather, health was related also to aspects of life such as politics, social relationships, philosophical prowess, and citizenship, in relation the soul's health (moral health).²⁵ The concept of health was closely related to the ideal Greek citizen, as health was considered important in the context of ethics and leadership, or the capability to carry out one's roles in life.²⁶ Thus, views on health also contained metaphysical and virtuous elements in the greater Greek world, in addition to its pragmatic components. Although I very briefly note these other aspects of health, the Hippocratic, medical views and their relation to EIM are the primary concern here and throughout this work.

The most important aspect of the Hippocratic understanding of health is the need for harmony between the four fluids of the body (blood, phlegm, yellow bile and black bile) and their four corresponding qualities (heat, dry, humid and cold).²⁷ The Hippocratics believed that illness came from the upset of this balance, and "thus the important thing for maintaining health is to practice a way of life that allows for minimum disturbances to occur in the body. Since balance can easily be disrupted by external factors, efforts (were) concentrated on regulating the physical and nutritional conditions of the human body... According to this tradition—mainly illustrated by Hippocrates in *Air, Waters and Places*—health is defined on the basis of an equilibrium achieved between environmental forces on the one hand (wind, temperature, water,

²⁵ See Plato *Republic* IV, but especially 445A for the identification of virtue with spiritual health. Also see *Timaeus* 46a-47b. For Xenophon see *Memorabilia* 1.2 and 1.6.

²⁶ *ibid.*

²⁷ Tountas, Y. 2009:186, citing Temkin, O. 1995: The Hippocratics are influenced from the Pythagoreans who "maintained that harmony, perfect equilibrium and perfect balance were the key elements to health."

ground and food) and individual habits on the other (diet, alcohol, sexual behavior but also work and leisure).²⁸

Despite this complexity, the author of *Regimen* recognizes exercise as a necessity to achieve good health, thus supporting the central argument of this thesis:

διότι οὐ δύναται ἐσθίων ὁ ἄνθρωπος ὑγιαίνειν, ἢν μὴ καὶ πονῇ. ὑπεναντίας μὲν γὰρ ἀλλήλοισιν ἔχει τὰς δυνάμιας σῖτα καὶ πόνοι, συμφέρονται δὲ πρὸς ἄλληλα πρὸς ὑγείην·

“Eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health.”²⁹

How were these ideas on health used in conjunction with exercise to achieve health promotion, and how do we define ‘health promotion’ in modern vs Greek terms? Although it is commonly accepted that the basic concepts of health promotion have been developed in the last two decades, they have their roots in Greek antiquity. A 2014 study found that health promotion was one of three main categories observed in the Hippocratic provision of care.³⁰ Health promotion included physical activity as an essential part of physical and mental health, and emphasized the importance of nutrition to improve athletic performance. Yannis Tountas published a valuable article in 2009 which outlines the meaning of health in the Hippocratic context, and how this specifically relates to health promotion, showing the origin of the concept in Hippocratic care and the similarities to modern health promotion. The study by Tountas demonstrates evidence for “a radical re-orientation of health services, which shares a lot of similarities with Ottawa’s principles for health promotion.”³¹ Here again, we are dealing with

²⁸ Tountas, Y. 2009:186.

²⁹ *Regimen* 2 (Loeb IV 228). This is part of the passage used as my first exhibit of proof and is discussed in much more detail in section 3.2.

³⁰ Kleisiaris, C.F., Sfakianakis, C., and Papathanasiou, I.V. 2014:6.

³¹ Tountas, Y. 2009: 185.

two different definitions of health promotion; the first is simply concerned with the maintenance or improvement of health, while the second is concerned with the socio-political initiatives taken to enable individuals to seek health services, i.e. those outlined in the WHO charter, as seen above (page 5). When discussing exercise in the context of health promotion, we are dealing with both definitions in varying degrees. For example, the implementation of exercise through government funded gymnasia falls into the second definition, as does the Hippocratic School's efforts to spread education on these concepts.

Ultimately, we are here most interested in the prevailing views on exercise in relation to health held during the Hippocratic Period (460-360 BCE). The subject is well summarized by Susan Mattern, who recognizes that: "The subject of exercise is especially complex in its social and moral implications."³² As she points out, Galen recognizes two forms of exercise, which are also used in the Corpus: gymnastic (γυμνασία) and work (πόνος or ἔργα):³³

³² Mattern, S. 2008: 127.

³³ *ibid.* The influence of the passages analyzed in Section 3 of this paper are evident in this passage, especially of *Regimen* 62-66, where most of these same types of gymnastic exercises and their properties are discussed.

Z. I call the types of exercise (γυμνάσια) wrestling, the pancratium, boxing, the foot-race, and other things of that sort; and some of these belong only to the class of exercises, but others are not only exercises but work (ἔργα). Exercises are those already mentioned, and besides those arm-swinging, running by continually shortening the course (ἐκπλεθρίζειν), shadow-fighting, wrestling with hands, jumping, throwing the discus, or working out with the punching-bag, or with the ball, either small or large, or leaping with weights. Both exercise and work are digging, rowing, plowing, pruning vines, porting, reaping, riding, fighting under arms (ὀπλομαχεῖν), traveling, hunting, fishing, and whatever else in turn people practice, whether skilled or unskilled, for a living by necessity; whether building houses, or forging metal . . . and once when we were detained in the countryside in the winter, we were forced to split wood for the sake of exercise (ἔνεκα τοῦ γυμνάζεσθαι), and to throw barley into a mortar and crush and grind it, which every day people in the countryside were doing as work (ἔργα). (*San. tuend.* 2.8, 6.133–34K)

However, this distinction drawn by Galen is not absolute, with crossover between the terms being used in both the Corpus and elsewhere during the Hippocratic Period (read further below but especially see Section 3.2).

In first addressing γυμνασία, gymnastic exercise is best defined as a “system of physical exercises practiced either for recreation or for the purpose of promoting the health and development of the body.”³⁴ Galen distinguishes gymnastic exercise from manual labor (πόνος or ἔργα, as above), based on social class, as being a specialized, leisure type of exercise associated with the public gymnasia, and thus urban and civic life (i.e. something reserved for the patient who has the ideal lifestyle to care for their body).³⁵ As the term suggests, this specifically refers to naked-exercise, i.e. that which took place within the gymnasium under the supervision and guidance of gymnastic trainers (*paidotribai*).

³⁴ McNeil, R.J. 1911:752.

³⁵ Mattern, S. 2008:128.

Gymnastics was perceived as an art, or τέχνη (*technē*) that had the potential to achieve ἀκρίβεια (*akribēia*) by ‘adapting to changing circumstances,’ meaning that it was thought to be an exact science.³⁶ It met the criteria for a *technē* because it had a body of specialized practitioners and was a discipline that possessed a systematic method, like other Greek *technai*, such as medicine.³⁷ Medicine and gymnastics were classified as serious (*spoudaiai*) *technai*.³⁸ Gymnastics was directly compared to medicine for many reasons (some of which we have already seen), including its focus and tailoring to the needs of the individual. A gymnastic trainer would not prescribe the same exercise routine to all people in his care, just as a doctor would not prescribe the same treatment plan for each patient. Plato contrasts gymnastic trainers to lawgivers: where lawgivers apply a law to an entire group, gymnastic trainers would change the prescription based on new findings if it meant better health for the individual.³⁹ In gymnastic training, deliberation was required for adaptation to changing circumstances. What counted as a mean (*metron*), i.e. a balance between excess and defect for one individual was not the same for another, in either medicine or gymnastics.⁴⁰ In regards to these similarities, Aristotle went so far as to hold the sentiment that “individuals can be best cared for by a doctor or a gymnastic trainer.”⁴¹

The idea of a close connection between medicine and gymnastic exercise goes back at least to Herodicus of Selymbria and Iccus of Tarentum.⁴² Herodicus has historically been recognized as the teacher of Hippocrates and has recently been dubbed "the father of sports

³⁶ Schiefsky, M. 2005:367.

³⁷ Schiefsky, M. 2005:172 cf. *plt prt.* 319a-d.

³⁸ Schiefsky, M. 2005: 307.

³⁹ *Plt. Stat.* 294d-295b.

⁴⁰ Schiefsky, M. 2005:187, and 353 referencing *EN* 1106a36-b4 and *EN* 1180b3ff.

⁴¹ *EN* 1180b13-23.

⁴² Schiefsky, M. 2005:173. Schiefsky cites Plato for this (cf. *Plato Prt.* 316D, *R.* 406a, *Phdr.* 227d for Herodicus, and *Prt.* 316d, *Lg.* 839e-840a; as well as *DK* 25 A 1-3), in addition to the Hippocratic Corpus *Acut.* 9, 39.21-40.1.

medicine” for being the first recorded physician to have combined sports with medicine.⁴³ The parallel between medicine and gymnastics is also a Platonic commonplace, as seen from the following examples, provided by Schiefsky: *Grg.* 464b-466a (both gymnastics and medicine are concerned with care of the body and correspond to the two arts concerned with care of the soul, lawgiving and justice; gymnastics is preventative, while medicine is corrective,) *Prt.* 313d (where care of the body is concerned, the one who is qualified to judge what is good and bad is a gymnastic trainer or a doctor,) and *Plt.* 295c (both medicine and gymnastics must adapt to changing circumstances in order to deal properly with individual cases).⁴⁴ However, some Hippocratic authors resisted the assimilation of gymnastics and medicine, stressing the instability of athletes' εὐεξία, or 'good condition'.⁴⁵ The author of *Loc. Hom.* claims that gymnastics and medicine are in fact opposed to one another.⁴⁶ In *R.* 405c-406e medical treatment modeled on gymnastic training is condemned. Evidently, views about the aims and functions of Hippocratic medicine and the gymnastic exercise differed in some respects, as demonstrated by *EN* 1138a29-31: “medicine aims at the healthy (ὕγιεινόν) and gymnastics at what brings about good condition (εὐεκτικόν), both of which are a mean between excess and defect.”⁴⁷

When discussing physical exercise in the context of this study, we are not only focusing on gymnastic exercise, but also on a broader category of exercise which may be described using the terms πόνοϛ (encompassing a range of exercises, from any physical exertion to strenuous physical activities), or ἔργα (usually reserved for practical, manual labor). The author of *Regimen*, one of the key texts used in this paper as proof of EIM in the Corpus, distinguishes two

⁴³ Georgoulis, A.D., Kapidou, I.S., Velogianni, L., Stergiou, N., and Boland, A. 2007:1-10 for this designation. See section 2.2 for some discussion on the historicity of Herodicus as Hippocrates' teacher, and his role in using exercise in medicine.

⁴⁴ Schiefsky, M. 2005:173-174.

⁴⁵ Schiefsky, M. 2005:173. Cf. *Aph.* 1.3, L. 4.45 (8.11)- 460.6.

⁴⁶ Schiefsky, M. 2005:173.

⁴⁷ Schiefsky, M. 2005:174.

types of πόνοϛ (exercise). These categories are ‘natural’ exercises and ‘violent’ exercises (οἱ μὲν κατὰ φύσιν, οἱ δὲ διὰ βίης).⁴⁸ The first category mainly includes walking (περίπατοι). The second category includes comparatively more vigorous and strenuous exercises such as running (τῶν δὲ δρόμων) and wrestling (πάλη δὲ καὶ τρῖψις).⁴⁹ The written prescriptions of various degrees of walking, running, and wrestling regimens, based on factors such as patient age, are the major proofs used in this paper (see section 3.1). However, the ‘natural’ exercises also included activities that do not fit our modern definition of physical exercise in any way. I include a description of this category to display its difference from the modern definition of physical exercise and thus to demonstrate why I have not included it in my summary of evidence for EIM as understood in modern theory. These types of natural exercises are those of sight, hearing, voice and thought, and are explained in *Regimen 61*,

“The nature of sight is as follows. The Soul, applying itself to what it can see, is moved and warmed. As it warms it dries, the moisture having been emptied out. Through hearing, when noise strikes the soul, the latter is shaken and exercised, and as it is exercised it is warmed and dried. By all the thoughts that come to a man the soul is warmed and dried; consuming the moisture it is exercised, it empties the flesh and it makes a man thin. Exercises of the voice, whether speech, reading or singing, all move the soul. And as it moves it grows warm and dry, and consumes the moisture.”⁵⁰

In practice, the implementation of these types of physical exercises in the Hippocratic Period had many similarities to modern approaches towards ‘exercise is medicine’, as clinical exercise physiologists have kept many of the same methods that the Hippocratic doctors invented and prescribed in the Corpus. Tipton commends both Sallis, the pioneer of the EIM movement,

⁴⁸ *Regimen 61* (Loeb IV 349).

⁴⁹ *Regimen 63-64* (Loeb IV 352-357).

⁵⁰ *Regimen 61* (Loeb IV 349-351) translation from Jouanna, J. 1999:167.

and Berryman, an exercise-science historian, for informing EIM advocates in their publications that Hippocrates prescribed exercise to treat illness, and wrote about his beliefs on the health benefits of exercise.⁵¹ Although the term EIM did not exist for the Hippocratic doctors, the criteria of modern EIM existed within the Hippocratic Corpus, including: 1) Written prescription of moderate to strenuous exercise 2) Belief that idleness (inactivity), excessive exercise, and overpowering food consumption (compared with exercise) could lead to disease, and 3) Belief that training would increase stature, bone mass, muscle mass, tone, and endurance, digestion, temperature regulation, and tolerance against fatigue.⁵² Tipton finds that the centrality of the EIM concept is demonstrated in the following excerpt from *Acute Diseases* (*Hp. Acut. 3*):

“I say then, that this question [regimen] is a most excellent one and allied to many others, some of the most vital importance in the art [medicine], for that it can contribute much to the recovery of the sick, and to the preservation of health in case of those gymnastic [athletic] exercises, and is useful to whatever one wish to apply it.”⁵³

φημι δὴ πάγκαλον εἶναι τοῦτο τὸ σκέμμα καὶ ἡδελφισμένον τοῖσι πλείστοις τῶν ἐν τῇ τέχνῃ καὶ ἐπικαιροτάτοις: καὶ γὰρ τοῖσι νοσέουσιν πᾶσιν ἐς ὑγίην μέγα τι δύνασθαι, καὶ τοῖσιν ὑγαιίνουσιν ἐς ἀσφαλείην, καὶ τοῖσιν ἀσκέουσιν ἐς εὐεξίην, καὶ ἐς ὃ τι ἂν ἕκαστος ἐθέλῃ.

⁵¹ Tipton references Sallis, R.E. 2009. and Berryman, J.W. 2010. He quotes *Regimen 2* “eating alone will not keep a man well, he must also take exercise.” and “. . . food and exercise, while possessing opposite qualities, yet work together to produce health”. He concludes that Hippocrates was the first recorded physician to provide a written exercise prescription, i.e. for a patient suffering from consumption, stating that in *Diseases III* and *Internal Affections*, Hippocrates provided a detailed written exercise prescription of walking for a patient with consumption. This is erroneous in regards to *Diseases III*, but is correct for *Internal Affections*, as this is from *Internal Affections 12*. Analyzed in section 3.3.1.

⁵² Analyzed in section 3.4.1.

⁵³ Translation from *The Genuine Works of Hippocrates*. Hippocrates. Charles Darwin Adams. New York. Dover. 1868. I use this translation here, as it is the one Tipton chose.

Section 1.3: Scholarship Review

Finally, before moving forward with this analysis, and to conclude this introductory section, I now review a history of the scholarship on this subject, i.e. that focusing on physical exercise in the Hippocratic Corpus. This aspect of Hippocratic medicine has been largely ignored throughout the 20th and 21st centuries in the field of classical studies, despite prolific scholarship on the Corpus overall by scholars such as Jacques Jouanna and Elizabeth Craik. Although the subject has received less attention by classicists, it has garnered popularity in the fields of medicine, exercise science, kinesiology, and physiology (as also discussed in the ‘Methodologies and Terminology’ section, above).

I begin by acknowledging the secondary material that has already recognized exercise as a key component of Hippocratic medicine and demonstrated evidence for this. These studies have provided a starting point for my own research, and have been useful in the process of compiling examples of EIM from within the Corpus. However, despite these studies, there has not yet been an extensive summary of the evidence, as I have produced in section 3.

The most succinct summary of the Hippocratic provision of care and its principles comes from the findings of a 2014 study out of Greece.⁵⁴ This study consulted 185 articles from international databases (Medline, Scopus and Proquest) on Hippocratic medicine, determining that three main categories made up the Hippocratic provision of care; best encapsulated by the philosophy of ‘a healthy mind in a healthy body.’ These three categories were determined to be 1. Health promotion (with physical exercise as the key to maintaining health), 2. Interventions on trauma care, and 3. Mental care and art therapy interventions. In this study, Hippocratic care was

⁵⁴ Kleisiaris, C.F. Sfakianakis, C. and Papathanasiou, I.V. 2014. in “Health Care Practices in Ancient Greece: The Hippocratic Ideal,” *Journal of Medical Ethics and History of Medicine* 7:6, conducted a study/literature survey, in which they browsed 185 sources, eventually narrowing the data subset down to 17 sources that were found to meet their criteria and were the most influential for summarizing the fundamental principles of Hippocratic medicine.

found always to have been employed using a totally holistic approach, individualizing each patient, and with the position "that medicine should be practiced as a scientific discipline based on the natural sciences, diagnosing and preventing diseases as well as treating them".⁵⁵ Of further importance here is the conclusion that, "the Hippocratic tradition emphasized environmental causes and natural treatments of diseases, the causes and therapeutic importance of psychological factors, nutrition and lifestyle, independence of mind, body and spirit, and the need for harmony between the individual and the social and natural environment."⁵⁶

This same category of 'health promotion' in relation to Hippocratic *diaita* and exercise is also recognized by Yannis Tountas in his 2009 article "The Historical Origins of the Basic Concepts of Health Promotion and Education: The Role of Ancient Greek Philosophy and Medicine," as follows: "The physician who comes to attend to a town's population must consider not only the season, the winds, the water the people use or the geography of the place, but also the way people live: if they drink a lot of wine, if they eat well, if they get adequate rest and whether they are hard-working, whether they exercise, how much they eat. It should be stressed that good diet was crucial to health. The Greek word diet, as Sigerist notes in his writings, had a much broader meaning than the one we give to it today. Diet meant more than food and drink, diatetica (dietetics), the cornerstone of the healing art, involved an entire lifestyle. By diet Greeks meant a man's entire way of living, the relation between sleep and being awake, between exercise and rest and, of course, the choice of food, the quantity consumed and all other factors

⁵⁵ These quotations and summaries are taken directly from Kleisiaris, C.F. *et al.* 2014. This is a five-page article and there are no official page numbers for the article, which is published online through NIH (National Institute of Health). It is worth noting that the study also concluded that the underlying belief of these Hippocratic principles was indeed that mental and physical health were believed to be interrelated, and that the body and mind should be in harmony to achieve optimal health.

⁵⁶ Kleisiaris, C.F. *Et al.* 2014.

that constitute a man's life and must be controlled if the individual is to be not only healthy but also strong and beautiful.”

In a 2014 study, Charles Tipton, concludes that the Corpus demonstrates evidence for EIM, providing brief examples for this. Based on his analysis of *Regimen*, Tipton sees evidence that Hippocrates, “...believed idleness (inactivity), excessive exercise, and overpowering food consumption (compared with exercise) could lead to disease.”⁵⁷ And that, “His discussion in *Regimen I*, on how food can overpower exercise, has 2014 EIM overtones....Hippocrates believed that training would increase stature, bone mass, muscle mass, tone, and endurance, digestion, temperature regulation, and tolerance against fatigue.”⁵⁸

In a 2016 analysis of *Regimen*, titled, “The Role of Exercise in Hippocratic Medicine,” the text was also found to contain evidence for EIM based on two major categories; recognition of the "Correlation between Regimen, Age and Exercise,” and recognition of the "Characteristics-Properties of Exercises.”⁵⁹

These findings are consistent with my own, though they cover only a small part of my argument in section 3.2 (*Regimen I-III*). Tipton also concludes that, “...he (Hippocrates) was the first recorded physician to provide a written exercise prescription for a patient suffering from consumption.”⁶⁰ He bases this on his analysis of both *Diseases III*, and *Internal Affections*, in which the author provides an exercise prescription (specifically a walking regimen) for a patient suffering from consumption. Tipton seems erroneously to conflate *Diseases III* with *Internal Affections*, as there is no mention of exercise, walking, or any prescriptions of this sort in *Diseases III*. However, this is indeed prescribed in *Internal Affections* and this finding is

⁵⁷ Tipton, C. 2014:112.

⁵⁸ Tipton, C. 2014:112.

⁵⁹ Nomikos, N., Trompoukis, C., Lamprou, C., and Nomikos, G. 2016: 115-119.

⁶⁰ Tipton, C. 2014:113.

consistent with my own and forms part of my argument in section 3.3 (*Internal Affections*).

Tipton also recognizes that section 3 of *Regimen in Acute Diseases* provides the "centrality" of the EIM argument.⁶¹ I have also used this same passage as part of my argument in section 3.4 (*Regimen in Acute Diseases*), in addition to other passages from the text.

Within classical studies, publications on this subject have mostly been limited to only two mediums: translations and/or commentaries. More specifically, these are translations or commentaries from works of the Hippocratic corpus that mention exercise, which include *Ancient Medicine*, *Internal Affections*, *Regimen I-III*, and *Regimen in Acute Diseases*.⁶² Outside of translation and/or commentaries, there have also been some publications that briefly discuss or mention exercise within the context of larger works. That is to say, there have been no dedicated publications on the subject, but rather some paragraphs on exercise in biographical works on Hippocrates, or in larger research publications concerning Hippocratic medicine.⁶³ A pair of 1995 publications on dietetics or *diaita* (prescriptions of regimen for diet and exercise routines in conjunction) by Elizabeth Craik, are the closest we have to something exercise-focused, though these mainly focus on the nutrition and diet.⁶⁴

Commentaries on the Corpus began in classical antiquity, with Galen being the most prolific.⁶⁵ Modern classical scholarship has produced several notable translations of the Corpus, which include some commentary on texts, beginning with a monumental ten-volume edition by

⁶¹ Tipton, C. 2014:113.

⁶² All of these specific mentions of exercise are discussed in Section 3.3 "Exercise as Medicine in the Hippocratic Corpus"

⁶³ Jouanna, J. 1999:162-164, and Craik, E. 2015: 22-29, 46-53, and 120.

⁶⁴ Craik, E.M. 1995A:387-402, 1995B: 343-350.

⁶⁵ See the Corpus Medicorum Graecorum/Latinorum (CMG) for a complete list of all the Latin and Greek commentaries on the Corpus, including Galen's. Some of Galen's notable commentaries include: *In Librum Hippocratis, de Natura Humana (HNH)*, *In Hippocratis de Morbis Vulgaribus, Commentarii (Hipp. Epid.)*, *In Prognostica Hippocratis Comment. (Hipp. Prog.)*, *In Hippocratis de Officina Medici (In Hippocratem de Officina Medici)(Hipp. Off. Med.)*, and *In Aphorismos Hippoc. (In Hippocratis Aphorismos) (Hp. Aph. Com.) (Hipp. Aph.)*

Emile Littré, published in the 19th century.⁶⁶ In the first half of the 20th Century, the collected works of Hippocrates were translated and published by the Loeb Classical Library. The Corpus was originally edited and translated by W.H.S. Jones as early as 1923 (Volume 1 of the Hippocrates collection), spanning into the 1930s, but more recent volumes have been translated by Paul Potter and published as recently as 2023.⁶⁷ However, these are not full, critical texts and there remains much commentary work to be done on the Corpus. Although these volumes are translations first and foremost, they do provide some very brief commentaries on the source manuscripts and general introductions to the works. However, these are too broad to have included any meaningful commentary on exercise.

There have been some translations/commentaries published that *do* go deeper into the material than the Loeb works, of which Jacques Jouanna is the most prolific contributors.⁶⁸ Rather than summarizing each individual commentary on the works listed above, it is more productive to move on to the publications that do provide substance in regards to the topic at hand.

In a 2005 translation and commentary of *On Ancient Medicine*, by Mark Schiefsky, in my view provides the most detailed and significant contribution to understanding exercise in the Hippocratic context, much of which has been referenced in the ‘Methodologies and Terminology’ section above. Schiefsky addresses specific mentions of gymnastic exercise in the text and goes deeply into the philosophy behind exercise and its relation to medicine in the

⁶⁶ Littré, E. 1839-1861. *Oeuvres complètes d'Hippocrate*, 10 vols. Paris. See *Texts* under 'Methodology' Section 1.2, which lists the translations used and/or consulted in my analysis, including Littré's editions, the Bude series by Joly, and the Loeb editions by Jones and Potter.

⁶⁷ Jones, W.H.S. 1923, *Hippocrates*, vol 1.: VM, Aer., Epid. I. and III, Jusj., Praec., Alim. Loeb Classical Library. Cambridge, MA: Harvard University Press. --1931. *Hippocrates*. Vol 4. Nat., Hom., Salubre., Hum., Aph., Vict. Loeb Classical Library. Cambridge, MA: Harvard University Press., and for the most recent Potter publication: Potter, P. 2023. *Hippocrates*. Vol 2. Prognostic. Regimen in Acute Diseases. The Sacred Disease. The Art. Breaths. Law. Decorum. Dentition. Edited and translated by Paul Potter. Loeb Classical Library 148. Cambridge, MA: Harvard University Press.

⁶⁸ For example, see Jouanna, J. 2000. *Hippocrate*, vol IV.3: *Epidemies V et VII* (Paris), 2013. *Hippocrate*, vol. III.I: *Pronostic* (Paris).

Hippocratic context. In doing so, he goes well beyond any other Hippocratic commentary that I am aware of.

There is a brief mention of exercise in conjunction with diet by Craik, but this surprisingly only comes in comparing the later 'similar range of methods in regimen' shared by Hippocrates and the 2nd c. CE physician, Aelius Aristides, where Craik simply states, "(Aristides) shows a similar range of methods in regimen combining dietary prescriptions, emetics, exercise, and bathing."⁶⁹ In Jouanna's 2012 publication of his *Selected Papers*, Chapter 8 is also specifically focused on Hippocratic *diaita*, but, like Craik, he focuses almost exclusively on food, not exercise.⁷⁰ Despite the choice to focus on food over exercise, Jouanna recognizes that exercise was explicitly stated to be a necessity to achieve good health in *Regimen I*, and that in both *Regimen* and *Airs, Waters, and Places*, 'diet' comprises three elements; food, drink, and exercise, quoting *Regimen 2*, the same passage which I use as my first exhibit of proof in section 3.2.⁷¹ Here we see that exercise compromises one-third of Hippocratic *diaita*, yet again receives little attention in the literature. Jouanna explains this choice as follows: "To adhere to the conference topic, I will focus above all on problems relating to an alimentary diet and leave exercise to one side, without wishing to pass over it in complete silence, since the balance between what we call nutrition and physical activity was judged essential by one Hippocratic doctor in his definition of good health. Yet even when restricting the subject in this way, I will have to be selective, due to the breadth of the Hippocratic Corpus, which is comprised of some sixty treatises which belong neither to a single author nor medical school. I have chosen three areas for discussion: diet and peoples; diet and human nature; diet and the environment."⁷² Given

⁶⁹ Craik, E.M. 1995A: 388

⁷⁰ Jouanna, J. 2012. 'Chapter 8: Dietetics in Hippocratic Medicine: Definition, Main Problems, Discussion' in *Greek Medicine from Hippocrates to Galen Selected Papers*. Leiden: 137-153.

⁷¹ Jouanna, J. 2012:151.

⁷² Jouanna, J. 2012: 141.

that exercise is, in comparison with other matters such as diet, a relatively small topic within the Corpus, scholars have chosen to focus on topics with more breadth.

In an expansive 2015 publication, *The 'Hippocratic' Corpus: Content and Context*, Craik writes a reader's guide to each individual text of the Corpus. In doing so, she covers exercise in some small detail as well. She indicates the passages that discuss exercise in her summary of content for *Regimen I-III*, and points out that exercise is used in the treatment of diseases within her summary of content for *Internal Affections*.⁷³ Due to the nature of the publication as a large-scale overview of the Corpus, she does not provide any elaboration on this topic.

In Jouanna's 1992, 500-page volume, *Hippocrates*, which mostly leaves no stone unturned in covering the physician's life, work, and legacy, just over a single page is dedicated to exercise.⁷⁴ However, Jouanna deserves credit for recognizing that "...Hippocratic physicians recommended a balance between diet and exercise," that "there was a catalog of exercises analogous to that of foods and drinks," and that "the author of *Regimen* distinguishes two kinds of exercises: on the one hand, natural exercises, mainly walks (though they had a vigorous aspect to them as well) and on the other hand, more strenuous exercises such as swinging of the arms, running, and various sorts of wrestling."⁷⁵

In examining older, more dated publications, a subsection of William Smith's 1875 'gymnasium' entry in the *Dictionary of Greek and Roman Antiquities*, titled 'The Relationship of Gymnastics to the Medical Art,' also addresses these same exercises from *Regimen*. Although archaic, this entry provides the most comprehensive, and helpful addition to the conversation on exercise in the Corpus and gives a detailed account on the evolution of gymnastics in medicine (based on dozens of primary sources) into the Roman period. Also, the motivations of Smith,

⁷³ Craik, E. 2015:135-136 and 266-276.

⁷⁴ Jouanna, J. 1999: 166-168.

⁷⁵ Jouanna, J. 1999: 167.

here, are evidently similar to my own, displaying an interest in the ancient use of exercise in medicine versus the contemporary: “The ancient physicians relied much on exercise in the cure of the dropsy, whereas we almost totally neglect it.”⁷⁶ (I also cover the use of exercise prescriptions in the Corpus for dropsy in Section 3.3 and 3.4). I hope that, by including this neglected source in my analysis, I can signal its value *de novo* for a modern audience.

This is the current extent of scholarship on exercise in the Hippocratic Corpus. By formulating my research using publications from outside the field, I hope that my work serves to expand the breadth of this topic, serving as a valuable summary of exercise within the Corpus, and also encouraging future work on the subject from within classical studies.

⁷⁶ Smith, W. 1875:584.

Section 2: Cultural Context: The Pre-Hippocratic to Hippocratic Period

Section 2.1: The Body and Health in the Sixth to Fifth Centuries BCE: A New Worldview

To understand properly how and why physical exercise became employed as a means for health promotion and medicine in the 5th century BCE, we must understand the shifts in Greek culture that influenced and helped contribute to the development of the Hippocratic School of Medicine. In this section, I provide background to this by broadly detailing the prevailing cultural, philosophical/scientific, and medical views related to exercise from the Pre-Hippocratic (650-460 BCE) to the Hippocratic Period (460-360 BCE). I demonstrate that a new worldview began to prevail in Greek culture, which helped shape this new medical institution, which taught and prescribed physical exercise as a health practice. I also relate how this new worldview manifested in the contemporary Greek artwork, and detail the relationship between the evolution of art (statuary and vase paintings) and new views on the body and health.

By the final decades of the sixth century BCE, there was a groundbreaking shift in worldview that permeated Greek culture on many levels. This new worldview saw the human body as a part of nature, or the natural world itself, as opposed to something that was susceptible to the wrath of the gods or divine punishment. I return again to Fox, who recognizes that these new ideas “helped relate healing and health to a general type of theorizing which had not been fully considered before.”⁷⁷ This shift became prevalent in medical, scientific, and philosophical thought, and also coincided with the newfound cultural importance that was placed on the body in Greek society. Elements of this new worldview at its earliest can be traced to Anaximander, the Pre-Socratic Greek philosopher, living c. 610-546 BCE in Miletus.⁷⁸

⁷⁷ Fox, R.L. 2020: 41. This section draws heavily on the conclusions made by Fox here in chapters 3 and 4.

⁷⁸ Fox, R.L. 2020: 40-41.

Carlo Rovelli, a theoretical physicist writing in 2023, maintains that Anaximander was the first modern scientific thinker in history.⁷⁹ He was a student of Thales of Miletus, who, in his later years, was known as the first philosopher to devote himself to the study of nature.⁸⁰ One of Thales' famous achievements was the prediction of a solar eclipse.⁸¹ Thales was influential enough that his sayings continued to be written on walls and tablets into the Byzantine period.⁸² He wrote nothing down, continuing in the strictly oral tradition of his predecessors. However, in a significant move, Anaximander broke this tradition, writing in prose and becoming the first to publish a treatise on nature.⁸³ Unfortunately, except for a single fragment about natural laws that organize phenomena through time, the original is lost, forcing us to piece his innovative views together from later Greek philosophers who quote him, with Aristotle being the most helpful in this regard.⁸⁴ Anaximander also had two very influential pupils, who are especially significant

⁷⁹ The central thesis of Rovelli, C. 2023.

⁸⁰ Them., *Orat.* 317 "Later, when Thales was ap-proaching old age, he became the first person to devote himself to the study of nature." For the claim that Thales was the first to study nature, see Diog. Laert. 1.24, Thales A 7 Diels-Kranz. This section draws heavily on the claims made about Thales and Anaximander in Robert J.P. 2000.

⁸¹ Them., *Orat.* 317. Also see Hdt. I.74. Thales A 5 Diels-Kranz; Diog. Laert. 1.23

⁸² Them., *Orat.* 317: "Even today walls and tablets are covered with these sayings". On Thales' reception in Christian literature see Schwab, A. 2012. *Thales von Milet in der frühen christlichen Literatur: Darstellungen seiner Figur und seiner Ideen in den griechischen und lateinischen Textzeugnissen christlicher Autoren der Kaiserzeit und Spätantike*. Berlin, Boston: De Gruyter.

⁸³ Them., *Orat.* 317, translation from Robert J.P. 2000:

"Although Thales made so many contributions, he did not commit his findings to writing. Neither did anyone else up to that time. Anaximander, the son of Praxiades, was a follower of Thales, but he did not follow him in every respect. He quickly innovated and deviated from Thales by being the first of the Greeks of whom we know to have dared to publish a written treatise on nature. Previously, writing treatises had brought reproach upon a person. It was not customary among the Greeks before Anaximander."

⁸⁴ Simplicius, DK 12B1. IEP Translation:

Whence things have their origin,
Thence also their destruction happens,
As is the order of things;
For they execute the sentence upon one another
– The condemnation for the crime –
In conformity with the ordinance of Time.

for carrying on the philosophical and scientific tradition that he established, namely Anaximenes and Pythagoras.⁸⁵

Anaximenes was the third and last philosopher of the Milesian school and was also influential in helping to perpetuate these new ideas concerning the natural world. Miletus was destroyed by the Persians in 494 BCE,⁸⁶ and, again, his original texts do not survive, but were reconstructed by later thinkers such as Aristotle, Simplicius and Theophrastus.⁸⁷ He had at least one complete text, which was a response to Anaximander's *On Nature*. Most relevant here is that he continues in the tradition of providing early examples of natural science and scientific writing. The Hippocratic doctors developed ideas virtually identical to Anaximenes', such as that air was the basis of health, providing life and carrying diseases.⁸⁸

The significance of these individuals' innovations should not be understated, as scholars like Constantine J. Vamvacas recognize: "(The Milesian philosophers) had achieved a true intellectual revolution that would prove decisive and seminal for the entire development of Western thought. The veil of myth is suddenly raised, permitting for the first time a rational, critical examination of the cosmos. Uncontrolled interventions of anthropomorphic divinities are abolished and give way to purely natural phenomena and causations."⁸⁹ Vamvacas summarizes this significance as follows, "In Ionia, the Milesians, with an unbounded faith in their powers of reason, attempted to provide the first systematic, rational explanation of natural phenomena.

⁸⁵ Porphyry, *Vit. Pyth.* 2 for the claim that Pythagoras studied under Anaximander.

⁸⁶ Vamvacas, C.J. 2009:49. Here Vamvacas states the incredible significance of this destruction: "In 494B.C. Miletus would be razed by the Persian army, a horrible punishment for the Milesians's attempt to rebel against the dynasty. This would also mark the end of this intellectual center in which the first philosophic and scientific discourse was developed."

⁸⁷ Sandywell, B. 1996:180-181. Other commentators on Anaximenes are Aetius, Hippolytus, and Plutarch. Simplicius, *Commentary on the Physics of Aristotle* is a valuable source for Anaximenes' teachings.

⁸⁸ Vamvacas, C.J. 2009:49. Vamvacas states: "The synonymous words *aer* and *pneuma* would also become terms in ancient Greek medicine. 'Air is of the highest ruler in every respect', notes the author of *Peri Physon* 3 of the *Corpus Hippocraticum*: 'Air is essential for life but is also a carrier of illnesses. Air empowers both objects and living organisms.'"

⁸⁹ Vamvacas, C.J. 2009:51.

Their thought thus marked the path of the natural sciences. In contrast, in southern Italy philosophy would be founded in the sense we know it today.”⁹⁰ In regards to southern Italy, this refers to Pythagoras, one of the most important figures in the history of philosophy, due to his influence on Plato and Aristotle, thus influencing the future of the Western world in many ways. He lived c. 570-495 BCE, with the most significant period of his life here being between 530-510 BCE, when he moved westward from the eastern edges of the Greek world, living and teaching in the southern Italian city of Croton.⁹¹

Croton itself was known as the ‘healthiest’ city of this period, so much so that the phrase, ‘healthier than Croton’ became a popular proverb: "And this, it is said, is what gave rise to the other proverb, 'healthier than Croton,' the belief being that the place contains something that tends to health and bodily vigor, to judge by the multitude of its athletes." (καὶ παροιμίαν δὲ ὑγιέστερον Κρότωνος λέγουσαν ἐντεῦθεν εἰρησθαί φασιν, ὥς τοῦ τόπου πρὸς ὑγίειαν καὶ εὐεξίαν ἔχοντός τι φορόν διὰ το πλῆθος τῶν ἀθλητῶν).⁹² It became famous for its practicing physician Democedes, Herodotus' renowned travelling-doctor who exemplifies sixth century-medicine's highest achievements.⁹³ Between 580-480 BCE it produced at least thirteen homegrown victors in running at the Olympics, and famously Milo, a pupil of Pythagoras, who won six consecutive Olympic victories in wrestling.⁹⁴ This is an early example of health being associated with athletic capability, and it is probably not coincidental that Pythagoras pursued research on health and healing while dwelling there.

As Pythagoras was another solely oral teacher, we must rely on later records to understand his teachings. Iamblichus, a third century, Neoplatonic philosopher, provides one

⁹⁰ Vamvacas, C.J. 2009:51.

⁹¹ Fox, R.L. 2020:57, after this time he is believed to have moved to Metapontum.

⁹² Str. 6.1.12

⁹³ See section 2.2 for the transition from travelling doctors to Hippocratic medicine.

⁹⁴ Fox, R.L. 2020:56-57. For Milo as a pupil of Pythagoras see Strabo 6.1.12 and Iambl. VPyth. 267.

telling saying that was ascribed to Pythagoras by Aristotle; "What is the wisest thing in the human realm? The art of medicine."⁹⁵ Pythagoras also focused some of his teachings on diet, specifically on vegetarianism.⁹⁶ Fox concludes that these teachings, along with his notion of harmony, "were probably extended to apply to the general goal of health."⁹⁷ Christoph Riedweg believes that Pythagoras was even viewed as a 'healer' by his contemporaries, citing both Diogenes and his known association with Democedes as evidence.⁹⁸

Even after 510 BCE, Croton would continue to maintain a connection to both Pythagoras, and to ideas on the body and health through another thinker named Alcmaeon; a man who may be seen as a microcosm of this section, one who was a product of an athletic, exercise-focused, and health-oriented culture in Croton, and one who demonstrates the early link between medicine and philosophy.

Alcmaeon wrote a text addressed to three of Pythagoras' pupils, which allows us to date him quite firmly to this period.⁹⁹ He was a natural philosopher who moved beyond the oral-teaching Pythagoreans. Like Anaximander before him, he also wrote a treatise (*On Nature*) in prose and created a theoretical framework within which he presented his ideas on health, healing, and sickness.¹⁰⁰ He wrote mostly on medical topics, detailing his ideas on health and the

⁹⁵ Iamb. V. Pyth 82. Riedweg, C. 2005: 77.

⁹⁶ Riedweg, C. 2005:10, 36-37. Although there were health aspects attributed to some of Pythagoras' ideas on diet, such as the laxative effect of beans (see Aristox. Fr. 25 Wehrli), his stance on vegetarianism largely was based on moral and philosophical grounds: "But he also gave the following advice: Do not harm, neither destroy, nor hurt, cultivated and fruit-bearing plants or living creatures that by their very nature do not harm humankind"(Porphyry, VPyth. 39).

⁹⁷ Fox, R.L. 2020: 57. Fox cites Riedweg, C. 2020:10, 36-37, 77 for this conclusion.

⁹⁸ Riedweg, C. 2005:77, Diog. Laert. 8,12.

⁹⁹ The ability to date this text comes from the names of the addressees; Brontinus, a known son of one of Pythagoras' pupils, and Leon. Both were from Metapontum, which tells us the text must belong to after c. 510 BCE, when Pythagoras left Croton and moved there. Fox is not persuaded by Guthrie, who argues against this date. See Guthrie, W.K.C. 1962. See D-K 24 B1-39; B17 for the names, discussed in Longrigg, J. 1993:49. and D-K 24 FI for Brontinus.

¹⁰⁰ Fox, R.L. 2020:58. For the Pythagoreans as oral teachers, see Iamb. VP 72, Riedweg, 2005: 101-103. For Alcmaeon's *On Nature*, see D-K 24 A1 (Favorinus) and A2 (Clement and Galen), discussed by Perilli, L. 2001:65-79.

functioning of the body, as part of the same new idea of nature expressed by the Pre-Socratics. Thus, he maintained the view of the body as part of the natural world, attributing nothing to the gods when it came to disease and sickness, viewing disease instead as a natural, ongoing process.¹⁰¹ In an innovation that would prove incredibly significant for medical writers of the next generation (i.e. the Hippocratics), he related health to the equality between paired opposites. In other words, he believed that the balance between elements such as hot and cold, dryness and moisture, excess food or lack thereof, had implications for the body's ability to maintain health and fight off sickness.¹⁰² He wrote on specific topics like sleep, semen, and the senses, even going so far as to recognize that sense perceptions were relayed to the brain through channels.¹⁰³ He also became known as the first man in Greece to use experimental dissection for his research.¹⁰⁴

In the last two decades of the sixth century BCE, there was also a very noticeable change in art, compatible with this same, new worldview. This first became apparent in vase-painting, specifically from a group of experimentally-minded Athenian artists known as the 'Pioneers.'¹⁰⁵ This included painters like Euphronius and Euthymides, who both showcased new detail and anatomical accuracy, specifically in features of bone, muscle, flesh and veins (including within scenes of exercise or athletics, both in competition and in training).¹⁰⁶ Development of scenes portraying the body in motion also began to appear in relief carvings around the same time. Just a few decades later, an even more masterful level in the portrayal of realistic human figures; those moving in a naturalistic manner, was reached with sculpture in the round (many works still

¹⁰¹ Fox, R.L. 2020:58-60; D.L. 8.83. D-K 24 B4 p. 216 lines 3-4 for disease as a result of natural causes like water and exhaustion.

¹⁰² Fox, R.L. 2020:60-61; Arist. *Metaph.* I.986A31-B2 and D-K 24 B4.

¹⁰³ Fox, R.L. 2020:59; D-K 24 A5 with Barnes, J. 1979:149-150 on D-K 24 A11.

¹⁰⁴ Fox, R.L. 2020:59; D-K 24 A10, citing Chalcidius.

¹⁰⁵ Pedley, J.G. 2012:201.

¹⁰⁶ Pedley, J.G. 2012: 201.

being focused on representing athletes).¹⁰⁷ This period is referred to as the 'Period of Transition,' which gave birth to the Severe Style of sculpture.¹⁰⁸ This style was made up of six basic characteristics, as follows: 1. A certain simplicity or “severity” of forms. 2. A change in drapery. 3. A change in subject matter. 4. Interest in emotion. 5. Interest in motion, and lastly 6. The predominant use of bronze.¹⁰⁹ This Severe Style of Greek sculpture began shortly after the end of the Persian Wars and led the way for what would eventually become the High-Classical Style, believed by many to be the pinnacle of perfection for sculpture in the round.¹¹⁰ Again, I quote Fox, who recognizes the cultural context within which this trend began, during the time of a revolutionary invention that would change the world forever; the *gymnasion*: “Particular painters and sculptors indicated lines of muscle and sinews on the naked body where earlier artists had left a blank surface...There was an obvious social context for this new attention and expression. Naked bodies were to be seen all around these artists in a post-Homeric invention, the *gymnasium*... and it may be justly observed that the Greeks would never have attained their preeminence in sculpture had not their gymnastic and athletic exhibitions made the artists familiar with the beautiful forms of the human body and its various attitudes.”

There was evidently a massive cultural shift towards the reverence for the naked body that either coincided with or resulted from the invention of the *gymnasium*, and the *gymnasium*’s association with health and Hippocratic medicine has been posited by Tountas: "Therefore, it is

¹⁰⁷ Pedley, J.G. 2012: 202.

¹⁰⁸ Scholars such as Ridgway point out that it would be wrong to assume that the Severe Style and the “Transitional” or “Severe” Period are synonymous. This is because not all works between 480-450 BCE demonstrate “Severe” characteristics and works after this period are Severe in style as well. Therefore, the Transitional Period should be defined as the time in which the Severe Style predominated sculpture, before giving way to the influence of Pheidias and the High-Classical style. Though some scholars, such as Hallet, see a much more complex relationship between the Severe and Classical Styles and even argue that Severe sculpture is technically more ‘Classical’ in style than the High-Classical Style because of its innovativeness. Ridgway, B.S. 1970: 3. Hallet, C.H. 1986: 82.

¹⁰⁹ Ridgway, B.S. 1970:8-10.

¹¹⁰ Pliny believed the most important sculptures to have been done in the 5th and 4th centuries BCE, but only beginning with the works of Pheidias in 448 BCE. and after 292 BCE. Pliny says “there was no more art” (Nat 34.51-52). Mattusch, Carol. C. 2004: 277.

not accidental that the well-known Asklepieions, a temple to the god, where Hippocratic medicine was practiced, like in Epidaurus, Cos and Pergamon were located in the countryside, in a valley or on a hill where the climate was healthy and the water was pure, among beautiful and clean surroundings. Nor was it accidental that these temples had in close proximity theatres, gymnasiums, pools and other facilities where the holistic approach to health was implemented in practice providing the prerequisites for physical, psychological, social and spiritual well-being. All these innovations comprised a radical re-orientation of health services...”.¹¹¹ In my view, this is not a surprising conclusion, considering the interest in the gymnasium shown by the author of *Ancient Medicine*, as discussed in section 1.2.¹¹²

Ultimately, these major cultural developments concerning the body and health, making their way around and across the Greek world, coincided with the scientific tradition that helped Greek thinkers and doctors change their views of diseases and sicknesses from being something supernaturally and divinely associated into a developed understanding of the human body and its processes as part of the natural world. This fundamental change in worldview was one of the important factors that eventually led the various authors of the Hippocratic Corpus to become the first doctors in history to write down complete guides on matters that previously could only be learnt firsthand as the family member or apprentice of a doctor. Hippocrates and the other doctor-authors of the Corpus (known now as the ‘inventors of medicine’) separated themselves from contemporary practitioners in this period by creating the first ever institution of professional doctors. Previously, doctors only learned from oral tradition and this was always tied to the family trade or sometimes paid apprenticeships. In section 2.2 below, I provide an

¹¹¹ Tountas, Y. 2014:7.

¹¹² See section 1.2. page 5-6 for *Ancient Medicine*, 1.4.

introduction to the Hippocratic doctors, along with a brief overview of the history of medicine in Greece (i.e. the pre-Hippocratic doctors) leading into to the second half of the fifth century BCE.

Section 2.2: The Hippocratic School and the Corpus

The purpose of this section is to provide a historical background to the founding of the Hippocratic School of Medicine, and thus to the creation of the Hippocratic Corpus. Moreover, this section is dedicated to defining the School and detailing the formation of this medical institution, which I argue utilized exercise as a form of medicine during the Hippocratic Period (460-360 BCE). I do so to tie the creation of the Corpus into the cultural, philosophical/scientific conditions of the previous section, and to familiarize readers with the institution responsible for authoring the texts examined in section 3 (*Regimen I-III*, *Internal Affections*, and *Regimen in Acute Diseases*).

It must first be said that the use of the term ‘school’ has been debated. The consensus was once that two rival medical schools existed contemporaneously: the Hippocratic School on the island of Cos, and another on the island of Cnidos. With the discovery of an inscription labelling the *ιατροί* of both Cos and Cnidos as an ‘association’ (κοινόν) of doctors, the existence of two distinct ‘schools’ was called into question.¹¹³ Now, some scholars have instead preferred to label the Hippocratic School of Medicine as a guild or professional association of doctors, rather than a school. Fortunately, the label does not impact the ideas about exercise held by the authors of the Corpus with respect to my topic. Therefore, when using the term ‘Hippocratic School of Medicine’ in this paper, I am specifically referring to the medical institution of doctor-authors

¹¹³ Jouanna, J. 1999:50: cites Hippocrates *Speech of the Envoy* (Littré IX, 414.4ff) and Museum of Delphi Inv. No. 225. The inscription was published by H.Pomtow, 1918. "Hippokrates und die Asklepiaden in Delphi," *Klio* 15:308.

(be it a guild, association or otherwise), founded on the island of Cos, c. 460 BCE. These doctors grew out of a common tradition of practitioners, known as the Asclepiades, and are credited as being the inventors of medicine. Previously, doctors in Greece were travelling doctors only, producing no medical texts. Before the founding of the school, it was only possible to become a doctor by inheriting the practice through the family-trade (by male inheritance, i.e. father to son). The Hippocratic School of Medicine left behind these previously established practices, teaching doctors *en masse*, and for the first time writing down teaching manuals and theoretical frameworks for medicine. What we know about Hippocrates himself has been openly debated for decades (much of which has been attributed to legend), and the 60 or so works comprising the Hippocratic Corpus were composed by a variety of different authors. The Hippocratic Corpus (often referred to simply as the Corpus) is the name given to this compendium of literature written by the doctor-authors of the Hippocratic School, which is the largest surviving body of early Greek prose. It is not my intention to dedicate this section, or any part of this work, to the larger debate on the authorship of specific works (for example, whether Hippocrates authored any of the texts himself).¹¹⁴ The works from the Corpus used within my arguments are those dated from between 450-360 BCE, and the details of exact dates, in this case, do not interfere with my argument.

To help explain the significance of the School's inception and its contributions to the

¹¹⁴ See Chapter 4 'Writings in Search of an Author' (pp. 56-71) in Jouanna, J. 1999 for the history of scholarship on the authorship of the Corpus, otherwise known as the 'Hippocratic Question.' Erotian provides the earliest known list of texts attributed to Hippocrates (see *Erotiani vocum Hippocraticarum collectio cum fragmentis* ed. E. Nachmansohn, 1918. Goteborg. 9). Galen's Commentaries also deal with the Hippocratic Question. Scholars writing in the 21st century have reopened the Hippocratic Question with illuminating conclusions. Fox, R.L 2020 has provided a date of 470 BCE for *Epidemics* 1 and 3, thus predating Hippocrates. He expands on his argument on the use of language of Aginetan coinage standards in "Dates and measures: history and some Hippocratic texts" (pp. 95-112) in *Ancient medicine, behind and beyond Hippocrates: essays in honour of Elizabeth Craik*, ed. Nutton, Vivian. Pisa). From this same collection also see Giorgianni, Franco, "The hallmark of anonymity. Questions of authorship in the Hippocratic Corpus, specifically regarding the so-called "Author C" (pp. 49-76), and see Börno, Maria and Coughlin, Sean. "Galen on bad style (kakozelia): Hippocratic exegesis in Galen and some predecessors" (pp. 145-176) for an investigation into "style" and its absence as a sign of Hippocratic authenticity.

field of medicine, it is useful to understand the history and function of Greek physicians leading up to c. 460 BCE (the beginning of the Hippocratic period). These earlier physicians (travelling doctors) lacked an organized body, pursued a much less holistic approach to medicine, and held a less-diversified, practical skillset than the Hippocratics. Much of the earliest data that we have for travelling doctors comes from Homer. Travelling doctors, thus, are known to us not from medical literature, as they wrote nothing down themselves. In Homer, these doctors focused almost exclusively on treating acute pathologies, such as flesh and bone wounds, while incorporating prayer in appeals for divine intervention in healing.¹¹⁵ These doctors were hired throughout Greece, especially during times of war, as a useful addition to any army's ranks. Travelling doctors who had exceptional reputations would be hired by Greeks, and non-Greeks of elite status in need of their services, but also helped common peoples.¹¹⁶ Herodotus provides the most detailed account in Greek literary history of such a doctor, Democedes. In the famous account, Democedes is hired by the Persian king Darius (c. 530 BCE) and enjoyed high status amongst his ranks, as was common for healers of the time.¹¹⁷ Herodotus never mentions the doctors of Cos or Cnidos, showing their lack of reputation at least prior to the end of the fifth century BCE.

The Asclepiades emerged out of the same tradition as these previous doctors (i.e. learning and practicing medicine as part of the family trade) and Hippocrates himself was part of the Coan branch of Asclepiades.¹¹⁸ The term 'Asclepiades' refers to all those doctors believed to have been descended directly from Podalirius or Machaon, the sons of Asclepius, the god of medicine, but later became a term to denote physicians in general.¹¹⁹ The Asclepiades originally

¹¹⁵ For travelling doctors see Dana, M. 2012: 249-266. And Nocita, M. 2012. Also see Fox, R.L. 2020:16-21.

¹¹⁶ Fox, R.L. 2020:21.

¹¹⁷ Hdt.3.130-138.

¹¹⁸ The Corpus and epigraphical sources use the phrase "by male descent" see Jouanna, J. 1999:9.

¹¹⁹ Jouanna, J. 1999:9-10.

followed the tradition of the pre-Hippocratic doctors, handing down their teachings orally, and by this tradition Hippocrates was a descendant of one of Podalirius' branches, the other of which settled in Cnidos.¹²⁰

Hippocrates' life can be dated thanks to two separate dialogues from Plato. Although written at the beginning of the 4th c. BCE, they are meant to have taken place in 430 BCE, attesting that Hippocrates was already famous for his contributions to the field of medicine and his teachings at least by the end of the 5th c. BCE:

"I mean, suppose you had your mind set on going to your namesake, Hippocrates of Cos, the famous physician, to pay him a fee for his services to you, and if someone asked you what this Hippocrates is that you were going to pay him, what would you say?"

"I would say a physician," he said.

"And what would you expect to become?"

"A Physician."¹²¹

And:

"Socrates: Do you think it possible, then, satisfactorily to comprehend the nature of soul apart from the nature of the universe?"

Phaedrus: Nay, if we are to believe Hippocrates, of the Asclepiad family, we cannot learn even about the body unless we follow this method of procedure.

Socrates: Yes, my friend, and he is right. Yet besides the doctrine of Hippocrates, we must examine our argument and see if it harmonizes with it.

Phaedrus: Yes.

Socrates: Observe, then, what it is that both Hippocrates and correct argument mean by

¹²⁰ Jouanna, J. 1999:11. This was established by Theopompus of Chios. See Theopompus, *FGH* 115F103.

¹²¹ Prot. 311b-c.

an examination of nature.”¹²²

Jouanna also concludes that these passages "reveal the importance of Hippocratic thought, and, at the same time, the influence of medical thinking in the intellectual history of Greece during the Classical Period.”¹²³

It is notable that Hippocrates also received his medical training from within the family by the same method as previous Greek physicians, but potentially with some new additions. There are some accounts claiming that Hippocrates received instruction from outside of his family from Herodicus of Selymbria, and that he may have learned from the accounts of healing inscribed on stelae at the shrine of Asclepius on Cos, though this is debated.¹²⁴ What is not debated is that Hippocrates did not only practice medicine, but also taught the art. Plato attests to this in *Protagoras*, stating that it was possible to study medicine with Hippocrates for a fee, as seen above.¹²⁵ Despite the use of the term 'Hippocratic School,' Hippocrates may not actually have been the founder of the school on Cos (based on the evidence for early dates c. 470 BCE of texts like *Epidemics*), but, "he did manage to confer an exceptionally lustrous reputation upon this school through his teaching.”¹²⁶ The school was revolutionary in that it opened medicine to disciples outside of the family of the Asclepiades, leading to widespread transmission of medical knowledge. Although the school may have possibly opened before Hippocrates' time, "(it) acquired an unprecedented scope from this time on.”¹²⁷ According to Galen, the school was

¹²² Phaedrus 270c.

¹²³ Jouanna, J. 1999:7.

¹²⁴ Jouanna, J. 1999:18 quotes Strabo:”And it is said that the dietetics practised by Hippocrates were derived mostly from the cures recorded on the votive tablets there.” Herodicus as his teacher is suggested in *Republic* 3-406a: "He [Plato] speaks of Herodicus of Selymbria... This is the Herodicus with whom Hippocrates of Cos studied.” Jouanna concludes that "It may be doubted whether this teacher of gymnastics and medicine...was Hippocrates teacher, for a Herodicus (believed by scholars to be Herodicus of Selymbria) is harshly criticized in *Epidemics* 6.3.18 for his overly severe therapeutic method, which killed patients suffering from fever by a regime of running, repeated bouts of wrestling, and hot baths.”

¹²⁵ Prot. 311.

¹²⁶ Jouanna, J. 1999:42.

¹²⁷ Jouanna, J. 1999:46.

opened when, "Hippocrates decided to make instruction available to strangers owing to an insufficient number of family members willing to carry on the medical tradition of Cos."¹²⁸ The physical location of the original school is not known for certain. Modern archaeology on the island is mostly limited to the eastern side, near the modern city of Cos. The famous Asclepieion there, at which the later Hippocratic doctors practiced, dates to the 4th century BCE, well after Hippocrates' departure from the island.¹²⁹ Hippocrates would have lived on the western side of the island near modern Kephalos, in the town of Astypalaia, which was levelled by an earthquake in the 4th century BCE.¹³⁰ It is worth considering that the school originally might have formed there, in the south-western part of Palatia, perhaps using an Asclepieion as well, as was later the case. However, no excavations have been completed there as of yet.

¹²⁸ Jouanna, J. 1999:46.

¹²⁹ For the dating of the Asclepieion of Cos, see: Asclepieion. Kos Island Greece. (n.d.). <https://kos.gr/historical-monuments-and-museums/asclepieion>.

¹³⁰ Jouanna, J. 1999:4, see Strabo 14.2.19 and Diodorus of Sicily 15.76.2.

Section 3: The Use of Exercise in the Hippocratic Corpus

Section 3.1: Exercise Prescriptions in the Corpus

The purpose of this section is to demonstrate my argument that physical exercise was prescribed for the purpose of health promotion and/or treatment of disease (exercise therapy) in the Hippocratic Corpus. I have done so by examining written evidence for this from the following texts: *Regimen I-III*, *Internal Affections*, and *Regimen in Acute Diseases*. I provide the original Greek text of the treatises, with an English translation, for each instance of a physical exercise recommendation and/or prescription, or of a theoretical position on physical exercise that displays intention for promoting health, and/or meets the criteria for EIM ('exercise is medicine').¹³¹ I provide a discussion of each of these excerpts, outlining how they meet these criteria. I discuss these excerpts from both the modern and ancient Greek perspectives, using secondary sources to define how the types of exercise being prescribed, and the benefits of such, correspond to modern exercise physiology. I also include discussions of the ancillary practices that are prescribed in conjunction with exercise from these excerpts (i.e. diet and recovery methods) using the same methodology. I also give careful attention to the similarities and differences in the role of exercise between these treatises, others in the Corpus, and the non-medical, contemporary literature. In doing so, I show how the exhibited passages separate and isolate exercise from its non-medical, socio-cultural functions, into a strictly medical medium (with the exception of *Acute Diseases* 3). I argue that this isolation further strengthens my argument for EIM precedence within the Corpus. The complete Greek (with English translation) for all sections of the texts analyzed have been included in an appendix, below.

¹³¹ Unless otherwise noted, the Greek text and the English translations come from the Loeb volumes of Potter or Jones, giving preference to Potter's translations where they exist.

Section 3.2: *Regimen I-III (ΠΕΡΙ ΔΙΑΙΤΗΣ ΥΓΙΕΙΝΗΣ)*

The following passages from *Regimen I-III* are instances of exercise recommendations for the purpose of health promotion, not therapies or prescriptions to treat specific diseases, as shown in section 3.3 and 3.4. I have chosen to present evidence from *Regimen* before *Internal Affections* and *Regimen in Acute Diseases* because this text defines the types of exercises prescribed as therapies in the latter, making for an informed progression on the subject. The text is made up of four books, but the fourth book is often designated as *On Dreams* and does not include any mention of exercise. The author of the text outlines the benefits of the types of exercises that he recommends for the purpose of achieving good health and also explains the properties and characteristics of these exercises. These include walking (a ‘natural’ exercise; κατὰ φύσιν) and running, arm exercises, and wrestling (‘violent’ exercises; τι βίαιον). The author begins the text with a thorough explanation on the complexities of regimen (*diata*), outlining the necessity to assess the individual completely before prescribing treatment. This includes consideration of age and external environmental factors such as seasonal changes. The implementation of the correct balance in the tripartite division of diet (food, drink, and exercise) is of particular concern to the author, and must be tailored correctly. I give two examples of exercise recommendations from this text, organized by order of appearance, beginning with *Regimen 2*, and following with *Regimen 62-66*.

3.2.1: Exercise in Hippocratic Regimen: *Regimen* 2

This passage begins by explicitly demonstrating a very strong position and advocacy for the necessity of exercise in health. The position is enforced by the language of necessity, and the author is particularly concerned with how exercise should be used to achieve health (ὕγιαίνειν). If the author believes food and exercise must be used together to facilitate good health, then we must also conclude that man *cannot* be in good health *without* exercise. The author reaffirms this exact stance in *Regimen* 69.¹³²

During the Hippocratic period, this idea that exercise could be used to promote health was not unique to the Hippocratic School. In this context, exercise types were not separated from gymnastic exercise. For example, when Xenophon's Socrates describes exercising to better his health, he specifically speaks of gymnastic exercise (πότερον ἐπὶ τούτῳ εἰ βούλομαι γυμναζόμενος μᾶλλον ὑγιαίνειν).¹³³ However, the author of *Regimen* divides exercise (πόνος) into two categories (previously outlined above and in section 1.2, the 'natural' κατὰ φύσιν and the 'violent' διὰ βίης) that do not appear elsewhere in the contemporary Greek literature. He then goes on to specify which exercises make up each category in section 62 (discussed in Section 3.2.2). Likewise, the idea of exercise and nutrition working together (regimen or *diata*) to facilitate health was not unique to the authors of the Corpus. However, again, exercise was not separated from gymnastics in this context, such as in Plato's *Republic* (ὅλην γὰρ οἶμαι τὴν τοιαύτην σίτησιν καὶ δίαιταν τῇ μελοποιίᾳ τε καὶ ᾠδῇ τῇ ἐν τῷ παναρμονίῳ καὶ ἐν πᾶσι [404ε] ῥυθμοῖς πεποιημένην ἀπεικάζοντες ὁρθῶς ἂν ἀπεικάζοιμεν. πῶς γὰρ οὐ; οὐκοῦν ἐκεῖ μὲν

¹³² "ἔστι δὲ προδιάγνωσις μὲν πρὸ τοῦ κάμνειν, διάγνωσις δὲ τῶν σωμάτων τί πέπονθε, πότερον τὸ σιτίον κρατεῖ τοὺς πόνοους, ἢ οἱ πόνοι τὰ σιτία, ἢ μετρίως ἔχει πρὸς ἄλληλα· ἀπὸ μὲν γὰρ τοῦ κρατεῖσθαι ὁποτερονοῦν νοῦσοι ἐγγίνονται· ἀπὸ δὲ τοῦ ισάζειν πρὸς ἄλληλα ὑγείη πρόσσεστιν." Jones, W.H.S. 1931: 382 (Loeb 4).

¹³³ Xen. Sym. 2.17

ἀκολασίαν ἢ ποικιλία ἐνέτικτεν, ἐνταῦθα δὲ νόσον, ἢ δὲ ἀπλότης κατὰ μὲν μουσικὴν ἐν ψυχᾷς σωφροσύνην, κατὰ δὲ γυμναστικὴν ἐν σώμασιν ὑγίειαν).¹³⁴

In this same vein, I note the differences in language used in an observation from *Ancient Medicine*: “ἔτι γοῦν καὶ νῦν οἱ τῶν γυμνασίων τε καὶ ἀσκησίων ἐπιμελόμενοι αἰεὶ τι προσεξευρίσκουσιν κατὰ τὴν αὐτὴν ὁδὸν ζητέοντες ὃ τι ἐσθίων τε καὶ πίνων ἐπικρατήσῃ τε αὐτοῦ μάλιστα καὶ ἰσχυρότερος αὐτὸς ἐωυτοῦ ἔσται.”¹³⁵ In this passage, the author also demonstrates an interest in the relationship between gymnastics and nutrition. However, the term *πόνος* is not used to describe exercise, but instead *γυμνασίων τε καὶ ἀσκησίων*.¹³⁶ The term *γυμνασίων* is not used by the author of *Regimen* until later in the text, when he goes on to describe the ‘violent’ exercises of running, arm exercises, and wrestling (see Section 3.2.2). The difference in definition between *πόνος* and *γυμνασία* is largely due to factors of social complexity and they are sometimes interchangeable based on the context (defined in Section 1.2, Terminology). Galen later provides an explanation of the distinction (*San. Tuend.* 2.8, 6.133-134K), though not absolute, with gymnastics being the leisure-activity version of exercise, associated with the gymnasium and civic life. This is separate from manual labor or other practical, utilitarian exercises, such as the cutting of wood, which may be qualified as an *ἔργα* and is employed in *Internal Affections* 30 (discussed in Section 3.3.2, below). Though, again, there is often some overlap in the use of the term *γυμνασία*, where gymnastics could sometimes broadly cover all categories of exercise, such as in Plato’s description of ‘pre-natal’ gymnastics, simply referring to a mother’s walking and the resulting movement of the fetus (*Plat. Laws* 739).

¹³⁴ “In general, I take it, if we likened that kind of food and regimen to music and song expressed in the pan-harmonic mode and in every variety of rhythm it would be a fair comparison.” “Quite so.” “And here variety engendered licentiousness, did it not, but here disease? While simplicity in music begets sobriety in the souls, and in gymnastic training it begets health in bodies.” *Plat. Rep.* 3.404D-E.

¹³⁵ *Ancient Medicine* 1.4.

¹³⁶ The difference between *πόνος* and *γυμνασία* is covered in Section 1.2 (Terminology).

The motivation of discussing exercise shown by the author of *Regimen* is strictly for the purpose of health (ὕγιαίνειν), whereas *Ancient Medicine* uses language which is not exclusive to health, but, usually, other factors like 'good condition' (εὐεκτικόν). The interests shown in gymnastic exercise in *Ancient Medicine* is more similar to that seen in *Acute Diseases* 9, where the author discusses the ability of barley gruel to help athletes achieve 'good condition' (καὶ γὰρ τοῖσι νοσέουσι πᾶσιν ἐς ὑγίειν μέγα τι δύναται καὶ τοῖσιν ὑγιαίνουσιν ἐς ἀσφάλειαν καὶ τοῖσιν ἀσκέουσιν ἐς εὐεξίην καὶ ἐς ὅ τι ἕκαστος ἐθέλει). The choice by the author of *Regimen* to not focus or recommend his exercise protocol to *τοῖσιν ἀσκέουσιν* (athletes or gymnastic practitioners), as the author of *Acute Diseases* does, despite being familiar with gymnastic types of exercise (which he goes on to equate with his 'violent' exercises) suggests that the author may have partly resisted the assimilation between the gymnasium and medicine (as was also the case from other authors in the Corpus, cf. *Aph* 1.3, and *Loc. Hom.* 35, and 74.3-5).¹³⁷ The author's proposed health benefits of walking exercises (περίπατοι) far outweigh those of his violent, gymnastic exercises, for which he also lists some negative effects (see Section 3.2.2). Thus, he is motivated exclusively by the medical use of exercise, aiming at the healthy (ὕγιεινόν), rather than by the broader, gymnastic use of exercise, which flourished within contemporary Greek culture. This instead had a broader meaning, and a great variety of uses.¹³⁸ There is a precedent set here with this distinction, showcasing a clear parallel with the foundation of modern EIM, as there is no importance or value placed on exercise outside of promoting health, isolating it from socio-cultural factors like the nude body, good-condition, outstanding citizenship, or sports/athletic performance.

¹³⁷ This is recognized by Schiefsky (1999:173) in regard to the works I site for comparison.

¹³⁸ see Forbes, C.A. 1945. 'The Expanded Uses of the Greek Gymnasium.' *Classical Philology* Vol 40. No. 1 (Jan): 32-42.

This passage also contains evidence for more complex observations about the physiological role of exercise and nutrition. This is present in the Hippocratic idea of excess and defect, demonstrating the belief that exercise uses up material, or breaks down the body (πόννοι μὲν γὰρ πεφύκασιν ἀναλῶσαι τὰ ὑπάρχοντα), whereas food and drink have the capability to replenish the body (σῖτα δὲ καὶ ποτὰ ἐκπληρῶσαι τὰ κενωθέντα). This shows a quasi-recognition that exercise breaks down muscle tissue, uses up macro and micronutrients, and that food (caloric intake) is needed for optimal recovery. This also demonstrates a sort of knowledge of caloric intake versus caloric expenditure and the balance needed to produce desired effect, i.e. that food (macronutrient) intake must be tailored to energy (caloric) expenditure so as not to induce catabolism or promote gain of unnecessary fat. Today, we know total macronutrient intake, energy expenditure, and net energy stores to be important factors in exercise and health, such as in managing body-fat percentage and energy levels, which must be tailored based on lifestyle, exercise, and age.¹³⁹ In my view, the author's description in Section 3.2.1 displays a more surface level understanding of this modern scientific fact. The author's same ideas also are comparable to the modern approach to building muscle and improving cardiovascular fitness by appropriately balancing diet and exercise. Modern studies have confirmed this idea, showing varying requirements of macronutrient (carbohydrates, fats, and proteins) and micronutrient (such as B vitamins) intake based on the type of exercise routine followed, such as for endurance exercise routines vs. resistance exercise routines.¹⁴⁰ The author admits that the attempt to find the perfect balance between excess and defect within this tripartite system is impossible, but that if it were, good health could be achieved. With modern exercise science, this perfect balance is much

¹³⁹ National Research Council (US) Committee on Diet and Health. Diet and Health: Implications for Reducing Chronic Disease Risk. Washington (DC): National Academies Press (US); 1989. "Calories: Total Macronutrient Intake, Energy Expenditure, and Net Energy Stores."6.

¹⁴⁰ Zhang, J., Chen, J., Sui, X., Drenowatz, C., & Wang, Q. 2023. Association between Different Types of Exercise and Intake of Nutrients including Carbohydrate, Fat, Protein, and B Vitamins in Young Adults. *Nutrients*, 15(4), 806.

closer to achievable, today, due to a combination of modalities. This includes the ability to monitor energy expenditure during and after the exercise process through methods like heart rate monitoring, coupled with detailed knowledge of an individual's body composition. In combination with this, thorough knowledge of an individual's genetics allows for a scientific approach to optimizing pre- and post-workout nutrient intake to replenish the necessary macro and micronutrients expended during the exercise process. Understandably, without these modern technologies, tailoring regimen to the individual with perfection was demonstrably perceived as an impossibility for the author. Nevertheless, we see in a more rudimentary form in this text an application of the basic principles of tailoring exercise and diet for promoting health.

3.2.2: Types of Exercise in Hippocratic Regimen: *Regimen 62-66*.¹⁴¹

These passages contain further evidence for Hippocratic knowledge of the physiological effects of exercise, expanding on the ideas shown in Section 3.2.1. However, they consider less the link between exercise and nutrition, focusing more on exercise alone. In this case, the author details the benefits and positive effects of multiple types of exercises, including walking (περίπατοι), running (δρόμος), ‘swinging arm’ exercises (τὰ παρασείσματα), and wrestling (πάλη). For this reason, I present these passages as further proof of exercise recommendations for the purpose of health promotion. Walking (περίπατοι) is of particular importance, as it is the only one of the exercises prescribed in the treatment of diseases (see sections 3.3 and 3.4). Walking is also the only exercise type in this exhibit that belongs to the author’s category of ‘natural’ exercises, as opposed to the ‘violent’. Outside of the Corpus, walking was not thought to belong to any exercise category, and is not classified alongside the gymnastic exercises. However, the health benefits of walking as a counterbalance to a sedentary lifestyle were perhaps known, as Xenophon alludes to when describing Isonomachus’ advice to his wife in his *Oeconomicus* (ταῦτα γὰρ ἐδόκει μοι ἅμα ἐπιμέλεια εἶναι καὶ περίπατος. ἀγαθὸν δὲ ἔφην εἶναι γυμνάσιον καὶ τὸ δεῦσαι καὶ μάζαι καὶ ἱμάτια καὶ στρώματα ἀνασεῖσαι καὶ συνθεῖναι. γυμναζομένην δὲ ἔφην οὕτως ἂν καὶ ἐσθίειν ἥδιον καὶ ὑγιαίνειν): “For I thought that would give her a walk as well as occupation. I also said it was excellent exercise to mix flour and knead dough; and to shake and fold cloaks and bedclothes; such exercise would give her a better appetite, improve her health, and add natural colour to her cheeks.”¹⁴²

Again, the author displays a quasi-recognition of many of the physiological effects and benefits of walking exercise that we understand today, such as that walking increases metabolism

¹⁴¹ *Regimen 61* is not included, as it focuses on the natural exercises of sight, hearing, and voice (discussed in section 1.2), which do not meet the criteria of EIM.

¹⁴² Xen. *Oeconomicus* 10.10-12. Translation from Marchant, E.C. 1979. Xenophon in Seven Volumes, 4. Harvard University Press, Cambridge, MA; William Heinemann, Ltd., London.

(κινευμένου τοῦ ἀνθρώπου, θερμαίνεται τὰ σιτία καὶ τὸ σῶμα), causes caloric expenditure (ἔλκει οὖν τὴν ἱκμάδα ἢ σάρξ, καὶ οὐκ ἔῃ περὶ τὴν κοιλίην συνίστασθαι· τὸ μὲν οὖν σῶμα πληροῦται, ἡ δὲ κοιλίη λεπτύνεται), reduces belly fat (καὶ τὴν γαστέρα οὐκ ἔῃ πίειραν γίνεσθαι), improves digestion/helps induce bowel movements (τὴν δὲ κοιλίην λύουσι), and even improves mental clarity and/or wellbeing (καὶ τὰ περὶ τὴν κεφαλὴν κοῦφά τε καὶ εὐαγέα καὶ εὐήκοα παρασκευάζουσι).¹⁴³ Today, regular brisk walking is known to help improve and/or maintain cardiorespiratory fitness and contribute 'substantially' to caloric expenditure.¹⁴⁴ It also has varying degrees of benefits for mental health in all age groups, improving cognition, quality of life, and mood disorders (such as anxiety and depression).¹⁴⁵ The author of *Regimen* specifically recommends walking just after meals to achieve many of these proposed benefits, which has also been proven as effective today.¹⁴⁶

Concluding section LXII, we get the first mention of gymnastic exercise in the text (οἱ δὲ ἀπὸ τῶν γυμνασίων περίπατοι) in reference to the benefits of walking after gymnastics. This leads into a discussion on running (δρόμος), the first of the gymnastic exercises discussed, and those labelled as 'violent' exercises by the author. Despite the difference in categorization, he recognizes many of the same benefits in running as in walking, but that running causes more energy (caloric) expenditure and burns more fat (ἰσχυναίνουσι δὲ καὶ προσστέλλουσι τὴν τε σάρκα καὶ τὴν κοιλίην μάλιστα), and thus requires a higher caloric intake to fuel the exercise (τοῖσι δὲ πολλὰ ἐσθίουσι συμφορώτεροι).

The idea of gymnastic exercises being used in medicine is not unique to this author. Rather, Plato credits the first use of gymnastic exercise in medicine as an innovation of

¹⁴³ The Loeb text prefers εὐαγέα here from Littré, though the eleventh century manuscript of Marcianus Venetus uses εὐπαγέα, which would lends itself even moreso to a mental health-based reading.

¹⁴⁴ Ehrman, J.K. et.al 2023:22.

¹⁴⁵ Table 2.1 in Ehrman, J.K. et al. 2023: 23.

¹⁴⁶ Hijikata, Y., & Yamada, S. 2011. "Walking just after a meal seems to be more effective for weight loss than waiting for one hour to walk after a meal." *International journal of general medicine*, 4, 447–450.

Herodicus (Ἡρόδικος δὲ παιδοτρίβης ὢν καὶ νοσώδης γενόμενος, μείζας γυμναστικὴν ἰατρικῇ).¹⁴⁷ As we have seen in section 2.2, Herodicus of Selymbria is thought to have been a teacher of Hippocrates. If this was the case, it is safe to assume that his tradition could have continued within the School. However, in the specific examples of exercise prescriptions from the Corpus used in the treatment of various diseases (analyzed below in sections 3.3 and 3.4), running, nor any other of the violent, gymnastic exercises are used in the treatment of disease. Again, only walking, which belongs to the author's 'natural' category of exercise is used in these prescriptions. It is then likely that these exercises were considered too intense by the School for patients suffering from acute diseases (such as kidney diseases, shown in both section 3.3 and 3.4), but were still recognized as beneficial exercises in regimen for unafflicted individuals. When discussing the rest of the gymnastic exercises, apart from running, the author uses language that is highly supportive of this idea, willing to criticize certain exercises.

Section LXIV begins with describing 'swinging of the arms' (τὰ παρασείσματα) as ἀσύμφορα. This is not mentioned elsewhere in Greek literature as an exercise type on its own, but is used to describe the motion of the arms in running.¹⁴⁸ Though it is unclear what exact movements are being described (e.g. whether weights are being used), evidently, he believes this exercise type to be too intense, causing injury regularly, and does not see any health benefits in it. Therefore, this exercise must be excluded from meeting the criteria of EIM. However, it is important to note that modern EIM also recognizes many exercises to be too intense and that recognizing the negative effects of certain exercises is necessary for effective exercise therapy. So, in this sense, the author is still showcasing behaviors conducive to effective implementation of EIM, which closely echo the following statement: "If exercise intensity acutely increases past

¹⁴⁷ Plat. R. 416A-B. Cf. Also *Prt.* 316D and *Phdr.* 227d.

¹⁴⁸ See Arist. IA 705a17.

the body's ability to repair itself, negative consequences, such as muscle strains, tears, and stress fractures, may result.”¹⁴⁹

The next ‘violent’ exercise type mentioned is a grouped type, interpreted in the Loeb translation as ‘sparring and raising the body’ (τὰ ἀνακινήματα καὶ ἀνακουφίσματα). Again, it is unclear exactly what movements he is describing here, as these do not exist elsewhere in Greek literature. William Smith’s 1875 ‘gymnasium’ entry in the *Dictionary of Greek and Roman Antiquities* addresses this as follows: “He (the author of *Regimen*) gives his opinion of the Ἀνακινήματα, or preparatory exercises, which served to warm and fit the wrestlers for the more vehement ones.” Preparatory exercises, perhaps something akin to ‘sit-ups’ or abdominal exercises, seems most likely. This is supported by καὶ τοῦ πνεύματος κενοῖ, as sit-ups require significant exhalation to complete the concentric portion of the exercise. Unlike the arm-swinging, the author is advocating for these exercises, based on παροξύνει (παροξύνει δὲ καὶ τὸ σῶμα καὶ τὴν ψυχὴν, καὶ τοῦ πνεύματος κενοῖ). This term is used positively in like instances, meaning a sharpening or stimulation of something, such as the mind (eg. *Isoc.*15.265). Although, elsewhere in the Corpus it can also be used negatively to describe irritation, or sicknesses worsening and becoming extremely severe (eg. *Hp.* VM 6). In later medical literature, the term is also used positively to denote the strengthening of medical applications (for example, see Gal.12.710 and Gal.18(2).167).¹⁵⁰

The author concludes section LXIV with observations on wrestling more positively. In addition to common wrestling (πάλη), he advises the ἀκροχειρία, or wrestling by the hands only, without close grappling; the κωρυκομαχία, the exercise of the corycus, or the hanging ball; the χειρονομία, a sort of dexterous and regular motion of the hands, and upper parts of the body; and

¹⁴⁹ Patel PN, Horenstein MS, Zwibel H. Exercise Physiology. [Updated 2024 Oct 6]. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing.

¹⁵⁰ J. Heeg, *Galen in Hippocratis prognosticum commentaria iii* [Corpus Medicorum Graecorum 5.9.2. Leipzig: Teubner 1915] 197-378.

the ἀλίνδῃσις.¹⁵¹ He recognizes that these various types of wrestling and grouped exercises are more conducive to muscular hypertrophy than walking or running, targeting the ἔξω τοῦ σώματος, or outer parts of the body (πάλη δὲ καὶ τρῖψις τοῖσι μὲν ἔξω τοῦ σώματος παρέχει τὸν πόνον μᾶλλον, θερμαίνει δὲ τὴν σάρκα καὶ στερεοῖ καὶ αὐξέσθαι ποιεῖ). This demonstrates further compatibility with modern EIM, as increasing skeletal muscle strength and endurance with resistance training is an important goal of many exercise therapies today. Resistance training for this purpose can be general or specialized and yields additional benefits such as improved bone mineral density and content, and improvements in cardiorespiratory fitness.¹⁵²

In section LXV he recommends using oil or dust accordingly to regulate body temperature and recommends using the dust for a brief cool down period after exercise in the summertime (ἐνδιατρίβειν δὲ ἐν τῇ κόνει μετὰ τοὺς πόνους ἐν τῷ θέρει, ὀλίγον μὲν χρόνον ὠφελεῖ ψύχουσα). Similarly, today cold therapies after exercise are used to improve recovery by decreasing delayed onset muscle soreness.¹⁵³

The author ends his description of exercises with section LXVI. Here he displays a profound recognition that ‘fatigue pains’ (which today we call ‘delayed onset muscle soreness’, or DOMS) affect untrained people more so than trained people, but that *unfamiliar* exercises, even to trained people, will still create increased delayed onset muscle soreness (περὶ δὲ κόπων τῶν ἐν τοῖσι σώμασιν γινομένων ὧδε ἔχει· οἱ μὲν ἀγύμναστοι τῶν ἀνθρώπων ἀπὸ παντὸς πόνου κοπιῶσι· οὐδὲν γὰρ τοῦ σώματος διαπεπύνηται πρὸς οὐδένα πόνον· τὰ δὲ γεγυμνασμένα τῶν σωμάτων ὑπὸ τῶν ἀηθῶν πόνων κοπιᾷ· τὰ δὲ καὶ ὑπὸ τῶν συνήθων γυμνασίων κοπιᾷ, ὑπερβολῇ χρησάμενα).

¹⁵¹ The most helpful definitions of these unique exercises come from Smith, W. 1875:583. He cites Antyllus, *apud* Mercur. *de Arte Gymn.p.123* for the definition of the corycus exercise.

¹⁵² Ehrman, J.K. et al. 2023:79-83.

¹⁵³ Xiao, F., Kabachkova, A. V., Jiao, L., Zhao, H., & Kapilevich, L. V. (2023). Effects of cold water immersion after exercise on fatigue recovery and exercise performance--meta analysis. *Frontiers in physiology*, 14.

Section 3.3: *Internal Affections* (ΠΕΡΙ ΤΩΝ ΕΝΤΟΣ ΠΑΘΩΝ)

Internal Affections is a nosological work, meaning that it covers the identification, symptoms, and treatment of diseases. In this way, it belongs to the same category as the other nosological works of the Corpus, known as *Diseases I*, *II*, and *III*. Due to the similarities between these works, it is often concluded they drew upon an even larger, common source, or a range of composite sources, and that they are either Cnidian in origin, or rely upon Cnidian material.¹⁵⁴ The treatise lists various treatment plans for a series of diseases, some of which include exercise prescriptions. I posit that these prescriptions, or exercise therapies, demonstrate further evidence of concordance with the modern criteria of 'exercise is medicine.' Those passages presented and analyzed are *Internal Affections 1, 12, 17, 21, 23, 30, 41* and *43*.

Section 3.3.1: Walking Exercise Prescriptions: *Internal Affections 12, 17* and *21*

In this section, I provide a comprehensive analysis of those passages which provide walking exercise prescriptions for the treatment of various diseases. In doing so, I point to the multifaceted use of walking exercise in the Hippocratic context and the perceived benefits of such, with intertextual comparisons to *Regimen*. Terminology of modern exercise science is used, while similarities to modern EIM principles are noted.

Internal Affections 12:

This passage provides an exercise prescription for the treatment of consumption (φθίσις), of which there are three types (see *Internal Affections 10*), aligning with the Cnidian subdivision of diseases outlined in Galen's *Commentary on Hippocrates' Regimen in Acute Diseases* (1.7).

¹⁵⁴ Craik, E. 2015:139 and Jouanna, J. 1999:68-69. Jouanna cites the recommendation to drink milk or whey-based purgatives (criticized by Cosian physicians) and the correspondence of Galen's Cnidian subdivision of diseases with *Internal Affections* as evidence for this. See Galen's *Commentary on Hippocrates' Regimen in Acute Diseases* (1.7)

This passage provides an exercise prescription for the treatment of the third listed type of consumption, which is said to make the patient experience the following symptoms: his spinal marrow fills with blood; his 'hollow vessels' fill with dropsical phlegm; pale yellow face and body; choking; vomiting; chills; sweating, and fever.¹⁵⁵ The English translation 'consumption' (what we now know as tuberculosis) may give the wrong impression that the patient is suffering from obesity or addiction (i.e. over-consuming either food or substances). However, the term φθίσις is referring to the consumption, atrophy, or 'wasting away' of the patient (i.e. the patient himself/herself being consumed), the opposite of αὔξησις.¹⁵⁶ This disease is not unique in the Corpus to *Internal Affections* (e.g. see also Hp.Epid.1.24 and Aph.5.11).

The author begins with an exercise prescription of walking, in conjunction with special dietary changes, having the patient work up gradually from 20 stades per day (just over 3 kilometers), and increasing by 5 stades per day during the first month of treatment until they achieve 100 stades (περιελθέτω σταδίους εἴκοσι τὸ | βραχύτατον ταύτη τῇ ἡμέρῃ· τῇσι δὲ ἄλλῃσι ἡμέρῃσι πέντε σταδίους ἄλλους ὑπερβαλὼν βαδιζέτω ἐκάστης ἡμέρης ἕως ἂν ἀφίκηται ἐς τοὺς ἑκατὸν σταδίους).¹⁵⁷ Thus, the author prescribes walking exercise. In doing so, he uses the concept of regimen demonstrated by the author of *Regimen* (discussed at length in section 3.2) in practical application. This shows a consistency in the medical use of diet and exercise between these two texts, with the language of regimen also explicitly being used (τὸ δὲ λοιπὸν τοῦ χρόνου διαιτάσθω μᾶζαν καὶ ἄρτον ἐσθίων ἀμφοτέρω).

In this case, unlike in *Regimen*, the author is prescribing exercise therapy for the treatment of a *specific* disease, rather than as a general recommendation for health, with walking distance and frequency generally increasing as the patient moves further into the recovery

¹⁵⁵ *Internal Affections* 12 (Loeb VI 96-97).

¹⁵⁶ See Pl. Phd.71b: μείζονος μὲν πράγματος καὶ ἐλάττονος μεταξὺ αὔξησις καὶ φθίσις, καὶ καλοῦμεν οὕτω τὸ μὲν αὐξάνεσθαι, τὸ δὲ φθίνειν;

¹⁵⁷ For reference, ten stades is the equivalent of 1.577 kilometers.

process. In the second month of treatment, the walking intensity temporarily decreases from the peak reached in the first month, as he prescribes a minimum of 40 stades per day (καὶ ὁδὸν ὁδοιπορεῖτω μὴ ἐλάσσω σταδίων τριήκοντα πρὸ τοῦ δείπνου, μετὰ δὲ τὸ δείπνον δέκα). Thus, month-one helps the patient build a tolerance to the required volume (i.e. distance walked per month) and duration of the prescription moving forward. A similar approach is still used in exercise practices today by gradually increasing intensity in both cardiovascular and resistance training, having the patient ‘peak’ before ‘deloading’, to help build the strength and endurance necessary to improve exercise performance and capacity.¹⁵⁸

By the fourth month, this increases to 80 stades, and begins to include more frequency, with a morning walk and walks between meals, in addition to the after-dinner walks (περιπατεῖτω δὲ τῆς ἡμέρης ὀγδοήκοντα σταδίους, μετὰ τὸ δείπνον εἴκοσιν, ὄρθρου δὲ τριήκοντα). Towards the end of the recovery process, the patient is to walk a staggering 150 stades per day, the equivalent of 23.655 kilometers (καὶ ὁδοιπορεῖτω τῆς ἡμέρης, ἑκατὸν πεντήκοντα σταδίους, μετὰ δείπνον εἴκοσι, ὄρθρου δὲ τεσσαράκοντα. οὗτος γίνεται ὑγιῆς μάλιστα ἐνιαυτῷ οὕτω θεραπευόμενος). Although this is a clear demonstration of modern EIM principles within Hippocratic Medicine, by modern standards, this level of volume and intensity is considered quite high, even in exercise recommendations for general, healthy populations, with 10,000 steps per day (roughly equivalent to 8km) being the consensus of moderate to vigorous walking.¹⁵⁹ However, 150 is not a random number, as this was the measurement used in contemporary Greece to gauge total travel time (e.g. a journey of 13,500 stades = 90 days of

¹⁵⁸ See both Bell, L., Strafford, B. W., Coleman, M., Androulakis Korakakis, P., & Nolan, D. (2023). "Integrating Deloading into Strength and Physique Sports Training Programmes: An International Delphi Consensus Approach." *Sports medicine - open*, 9(1), 87. and Rogerson, D., Nolan, D., Korakakis, P. A., Immonen, V., Wolf, M., & Bell, L. (2024). "Deloading Practices in Strength and Physique Sports: A Cross-sectional Survey." *Sports medicine - open*, 10(1), 26.

¹⁵⁹ Physical Activity Guidelines for Americans, 2nd edition page 111.

travel time) and may have been the distance expected to be covered per day for long range travel among Greek citizens (i.e. for military campaigns, trade, etc.).¹⁶⁰

Thus, the exercise intensity changes considerably as the health of the patient improves, with the accompanying diet also becoming less restricted, moving away from strictly vegetable juices and broths to include a much wider range of food groups, especially protein sources (καὶ κρέα πάντα ἐσθιέτω πλὴν βοείων καὶ χοιρείων). So, protein intake and overall caloric intake also increase as exercise volume and intensity increase. The knowledge of the need to adjust exercise to caloric intake and vice-versa was not unique to the Hippocratic doctors. Plato shows this was also understood, at least, in philosophical and/or gymnastic circles: “οὐκοῦν τότε δεῖται πλείστων πόνων, ὅταν ἡ πλείστη τροφή προσγίγνηται τοῖς σώμασι” (When bodies receive most food, then they require most exercise).¹⁶¹

Internal Affections 17

This passage provides an exercise prescription for the treatment of kidney disease (νεφροῦ τὸ νόσημα), of which there are 4 types (listed from *Internal Affections 14-17*), also correlating with the Cnidian subdivision later listed by Galen.¹⁶² The author prescribes walking exercise in conjunction with specific dietary changes, as he does for consumption, again divvying up sessions based on distance (stades) and frequency (time of day), strongly correlated with meal timing (ὅταν δὲ ἐς τὴν ἐσχάτην τοῦ σιτίου μερίδα ἀφίκεται καὶ ἐς τοὺς ἑκατὸν σταδίους, ἐσθιέτω μίαν μόνην μερίδα, καὶ ταύτης τῆς ἡμέρης περιπατησάτω ἑκατὸν σταδίους· μετὰ δὲ τὸ δεῖπνον εἴκοσιν, ὄρθρου δὲ τεσσαράκοντα).

¹⁶⁰ Hdt.5.53.1: πεντήκοντα δὲ καὶ ἑκατὸν στάδια ἐπ’ ἡμέρη ἐκάστη διεξιούσι ἀναισιμούνται ἡμέραι ἀπαρτὶ ἐνενήκοντα.

¹⁶¹ Plat. *Laws* 7.789a

¹⁶² *Commentary on Hippocrates’ Regimen in Acute Diseases* (1.7)

Here, the author prescribes a medication-free treatment for all four types of kidney diseases listed priorly. The intensity of the exercise prescription is similar to that given for consumption, having the patient gradually increase his walking distance by 10 stades per day for 10 days until a total distance of 100 stades (just over 15 kilometers) is reached in a single day (τῇ δὲ ὑστεραίῃ καὶ τῇ τρίτῃ καὶ μέχρι τῶν δέκα ἡμέρων ὑποβαίνων μερίδα, ἐλάσσω ἐσθιέτω, καὶ περιπατεῖτω δέκα σταδίους αἰεὶ πλείω ἐκάστης ἡμέρης). However, the treatment is much more acute (shorter duration), with the exercise prescription lasting a total of only 23 days, whereas the consumption regimen includes daily walking for 4 straight months. This shows the flexibility and versatility of the use of walking exercise within the text. Walking exercise is by far the most common and multifunctional exercise prescribed in the treatment of disease in the text. When gymnastic exercises are prescribed (see Section 3.3.2), their volume, intensity, and duration is given much less specificity. Walking is also generally recommended in the text with less specificity for certain diseases (covered below). The quintessence of walking, even in patients suffering from extremely debilitating symptoms, suggests its classification as a ‘natural’ exercise by the author of *Regimen* was a concept shared by author of *Internal Affections*. Walking, at least in moderation, is given favor over rest throughout *Internal Affections*, whereas gymnastic exercise, such as wrestling, has the potential to exert the patient too much, and is sometimes advised against in favor of rest, such as in *Internal Affections I* (Τοῦτον ἀνακομίζειν ὥς μάλιστα, ὅπως ἂν παχύτατος ᾖ, καὶ τοῖσι περιπάτοισι μετρίως χρήσθω, καὶ παλαιέτω ἥσσον ἐωντοῦ, καὶ πονεῖτω ὀλίγα τὸ πρῶτον, ἔπειτα δὲ πλείω, πολλὰ δὲ οὐδέποτε. ταῦτα ἦν ποιέη, ὑγιῆς ἔσται τάχιστα· ἦν δὲ λεπτὸς γίνηται διὰ τὴν ταλαιπωρίην, ἀνιέτω καὶ εὐωχέισθω ἡσυχίην ἔχων). The outlying diseases that prescribe exercise more intense than walking (i.e. possibly correlating to the ‘violent’ exercises of *Regimen*) are covered in section 3.3.2, below.

Again, in this instance, we have an historical precedent for the modern notion of EIM. More specifically, we have a unique example of exercise therapy being used for a disease category that existed both in the Hippocratic Period, as well as today. Chapter 13 of *Clinical Exercise Physiology: Exercise Management for Chronic Diseases and Special Populations* (cited frequently throughout this work) deals extensively with ‘Chronic Kidney Disease’. The chapter provides the modern standard of exercise prescriptions and exercise recommendations for patients suffering from CKD, with mode, frequency, intensity, and duration and progression specified.¹⁶³ The prescriptions given involve aerobic, resistance, balance, and flexibility exercises, showing benefits on resting blood pressure and visceral fat, with unsure results on serum lipids. Patients not on dialysis are shown to benefit from ‘standard exercise prescriptions used for the general population’ and are recommended to ‘start at a low to moderate intensity, and progress gradually.’¹⁶⁴ This modern data shows no obvious contradiction with the prescription detailed in this passage.

Internal Affections 21:

This passage provides a walking exercise prescription for the treatment of phlegm disease (τὸ φλέγμα), of which there said to be several types. This treatment is for the second, more severe type, called the ‘white phlegm disease’ (λευκὸν δὲ καλεῖται τοῦτο τὸ φλέγμα). Its symptoms are said to include paleness and flushing of the skin, body swelling, dry mouth, and rapid breathing patterns. Before the walking exercise can begin, the author indicates that the patient must first be treated by inducing a bowel movement. Due to the importance placed on the necessity of a bowel movement for curing the patient (τούτῳ ἢν μὲν ἡ γαστήρ αὐτομάτῃ ταραχθῇ, ἐγγυτάτω ὑγίης προβαίνει) it is likely that the physiological purpose of prescribing

¹⁶³ Ehrman, J. et al. 2023: 211-218.

¹⁶⁴ *ibid.* 215.

walking exercise, in this case, is for keeping the bowels moving. This suggests further shared beliefs about the characteristics of walking exercise between the author of *Regimen* and *Internal Affections*, as the benefit of walking to loosen the bowels is stated in *Regimen* 62 (τὴν δὲ κοιλίην λύουσι).

This walking treatment is even more acute (shorter duration) than for kidney disease, specifying the exact intensity and volume for only a single day (2 sessions totaling 50 stades), also correlated with meal timing and specific dietary changes (τῇ δ' ὑστεραίῃ περιπατήσάτω σταδίους εἴκοσι τὸ ἐωθινόν· ἐλθὼν δὲ φαγέτω ἄρτον μικρὸν ἔξοπτον, καὶ ὄψον ἐχέτω σκόροδα ὀπτά· καὶ πινέτω τοῦ αὐτοῦ οἴνου ὀλίγον ἀκρητέστερον. ἔπειτα βαδιζέτω σταδίους τριήκοντα, καὶ ὅταν ὥρῃ ἢ δείπνου, δειπνήτω ὅσον | περ καὶ ἡριστήκει, ὄψον δ' ἐχέτω μάλιστα μὲν πόδα ὑὸς καὶ κεφάλαια). The disease is also seen to be more acutely lethal (οὗτος αὐτῆς τῆς ἡμέρης τότε μὲν γίνεται ῥάων, τότε δὲ πονέει ἐξαπίνης καὶ δοκέει ἀποθανεῖσθαι) than the previous diseases discussed, and more drastic treatments are also recommended, such as purging and blood letting through incision of the scrotum (καὶ ἦν σοι δοκέῃ τοῦ αἵματος ἀφελεῖν ἀπὸ τῆς ὀσφύος, σικύην προσβάλλειν, καὶ τὰς ἐν ὄσχη φλέβας σχάσον τὰς παχυτάτας). However, after this acute treatment is applied, the regimen is still recommended to continue with increased volume and intensity daily according to caloric intake, though no goal distance is given, unlike for consumption and kidney disease (καὶ ἐσθιέτω αἰεὶ πλείω ἐκάστης ἡμέρης, καὶ ταλαιπωρεῖτω πρὸς τὰ σιτία τεκμαιρόμενος καὶ ὀλίγω πλείω).

Although this is another example of EIM principles within Hippocratic medicine, the modern equivalent of phlegm disease is unknown, such as for consumption. However, studies on acute exercise therapies, comparable in intensity to this walking prescription, have shown benefits for seemingly comparable illnesses, like the flu: "... moderate intensity exercise following influenza infection reduced lung inflammation by inducing a shift from Th1-type

inflammatory response to an anti-inflammatory Th2-type response and this was associated with a reduction in morbidity and mortality.”¹⁶⁵

Subsequently, the author provides some briefer walking exercise prescriptions for both dropsy (which is said to arise from phlegm disease) and jaundice, though they are far more brief and general, with no duration or distance given. Due to their brevity, I note them without deeper analysis, though include them to provide a complete list of the usage of such in the text. *Internal Affections 23* gives a general prescription of walking for dropsy, with 2 daily sessions: early morning and after dinner, though no distance is provided (καὶ περιπατεῖτω καθ’ ἡμέρην καὶ μετὰ τὸ δεῖπνον καὶ ὄρθρου, καὶ ὄψιος εὐδέτω, καὶ πρωῒος ἐξεγείρεσθω. καὶ ἥν μὲν ὑπὸ τούτων καθίστηται). *Internal Affections 41* provides the same, but for treatment of typhus (καὶ περιόδοισι ταλαιπωρεῖτω δι’ ἡμέρης καὶ μετὰ δεῖπνον καὶ ὄρθριος). The author expands on this slightly in *43*, stating that walking distance should be determined according to caloric intake (σιτία δὲ ἃ βούλεται προσφερέσθω· εὐωχέσθω δ’ ὥς μάλιστα, καὶ περιπατεῖτω πρὸς τὰ σιτία τεκμαιρόμενος). The flexibility of the regimen in both these cases is unique to the detailed specificity given for those discussed above (consumption, kidney disease, and phlegm disease), and especially for jaundice, where, by this stage in the treatment, the food selection is left entirely unrestricted (σιτία δὲ ἃ βούλεται προσφερέσθω).

¹⁶⁵ Martin, S. A., Pence, B. D., & Woods, J. A. (2009). Exercise and respiratory tract viral infections. *Exercise and sport sciences reviews*, 37(4), 157–164.

Section 3.3.2: Gymnastic and Other Exercise Prescriptions: *Internal Affections* 25 and 30:

For certain diseases, *Internal Affections* implies that exercises more vigorous than walking are beneficial to recovery, but always in conjunction with walking. These more vigorous exercises either fall into the category of gymnastic exercise, or include other practical, laborious exercises such as cutting wood (πρίειν ξύλα). Although these are scarcely added to the regimen (only in diseases that affect the spleen) they provide insight into the variety of exercises prescribed or recommended in the text and show further evidence of a belief system shared by the author of *Regimen* (i.e. effectiveness in the category of ‘violent’ exercise). The more precarious nature of these more vigorous exercises is showcased by the author, as their properties are shown to also have the potential to exert the patient too much during convalescence. As mentioned above, wrestling has the potential to exert the patient too much, and is sometimes advised against in favor of rest, such as in *Internal Affections* 1 (Τοῦτον ἀνακομίζειν ὥς μάλιστα, ὅπως ἂν παχύτατος ᾖ, καὶ τοῖσι περιπάτοισι μετρίως χρήσθω, καὶ παλαιέτω ἥσσον ἐωυτοῦ, καὶ πονεῖτω ὀλίγα τὸ πρῶτον, ἔπειτα δὲ πλείω, πολλὰ δὲ οὐδέποτε. ταῦτα ἦν ποιέη, ὑγιῆς ἔσται τάχιστα· ἦν δὲ λεπτὸς γίνηται διὰ τὴν τάλαιπωρίην, ἀνιέτω καὶ εὐωχέισθω ἡσυχίην ἔχων).

The only type of exercise prescribed or discussed in the text that may fall into the gymnastic category is wrestling, first mentioned near the very beginning of the text in *Internal Affections* 1 (καὶ παλαιέτω ἥσσον ἐωυτοῦ). However, to call it gymnastic in this case may be an anachronism, and the author does not use the term γύμνασις, as the author of *Regimen* does, to describe wrestling or any other exercise in the text.

Although dating of the Corpus is not a focus of this thesis, I briefly note that the lack of variety of wrestling types and omission of gymnastic language does suggest that *Internal Affections*, if it is a remnant or excerpt of a now lost work (as Craik suggests), was authored

before *Regimen*.¹⁶⁶ The original text may have been written when the palaestrae (wrestling schools) were well-established on Cos (as the patient in *Internal Affections I* is expected to have already been wrestling regularly), but when the more expansive gymnasium, or athletic complex, did not exist, or was not yet well-known to the author. Based on the text's practical application of regimen in the treatment of these various diseases, and the similarities discussed thus far, it is also likely that the author of *Regimen* used data from *Internal Affections*, or at least knowledge of *Internal Affections* passed down within the School, to help him summarize the properties of exercise. It does not appear that the more expansive selection of wrestling types described in *Regimen* were known to the author of *Internal Affections*, as he does not mention them or employ them as means to lessen the intensity when it would suit him (such as in *Internal Affections I*). Instead, the only variation he employs is 'wrestling with the tips of the shoulders' in 25 and 30 (παλαιέτω ἀπ' ἄκρων τῶν ὤμων), which is not mentioned in *Regimen*. Wrestling with the shoulders, as Potter points out, is likely referring to the starting position often portrayed in Greek art, similar to the collar-tie position in modern Greco-Roman wrestling.

Internal Affections 25 and 30

Internal Affections 25 provides an exercise prescription, in conjunction with diet, for the third of five listed types of dropsy (ὑδρεος). This type occurs within the spleen (ὁ ὑδρεος ἀπὸ τοῦ σπληνός) and is said to be caused by eating an abundance of figs, apples, or grapes in the late summer, resulting in the following symptoms: sharp pains in the spleen, shoulder, collar-bone, nipple and flank, fever, distension in the belly, and a swollen spleen. The author begins treatment by inducing vomiting and a bowel movement, by the same means as phlegm disease.

¹⁶⁶ See Craik, E. 2015: 135-136 for the claim of *Internal Affections* as a remnant of a lost work. Craik points out that *Internal Affections* was not known to Erotian and that Galen knew it under a different name.

The exercise prescription, again, is also very general and acute, with no specific duration or volume given for the exercises. Wrestling with the tips of the shoulders is recommended in conjunction with frequent walking, but no other specifications are provided (ἤν δ' ἐξάνιστηται καὶ δυνατὸς ἤ, παλαιέτω ἀπ' ἄκρων τῶν ὤμων, καὶ ταλαιπωρεῖτω περιόδοισι πολλῇσι δι' ἡμέρης, καὶ εὐωχέισθω ἃ προεῖρηται μάλιστα).

Internal Affections 30 provides a similar exercise prescription, in conjunction with diet, for the first type of spleen disease (σπληνὸς ἡ πρώτη), of which there are five types. This is said to be caused by prolonged sun exposure, and results in the following symptoms: fever, sharp pains in the spleen, flank and belly, mild constipation, yellow skin, weight loss, appetite loss, and fluctuating swelling of the spleen. Again, the treatment begins with inducing a bowel movement (but not vomiting) by the same means and for phlegm disease.

This exercise prescription is more specific than for dropsy of the spleen, with a specific duration of thirty days given for a new exercise: cutting wood (ἤν δὲ δυνατὸς ἤ, ἀνάγκα αὐτὸν πρίειν ξύλα τριήκοντα ἡμέρας). Cutting wood is not discussed as an exercise type in *Regimen* and does not fall into the category of gymnastic exercise elsewhere in Greek literature, though it is the physiological equivalent to more common, modern resistance exercises such as rowing. It is likely still considered a πόνοσ or an ἔργα in this case, being a non-sport-specific, more practical, laborious exercise. Today, cutting wood has become a sport-specific exercise, as it is an important event in many modern strongman competitions.

The author prescribes this alongside wrestling with the tips of the shoulders and frequent walks (καὶ ἀπ' ἄκρων τῶν ὤμων παλαιέτω, καὶ περιπατεῖτω δι' ἡμέρης). Although no volume is specified (i.e. distance for walking, or amount of wood to be cut) the combination of multiple higher intensity exercises (cutting wood and wrestling) with walking suggests this to be the most vigorous exercise prescription of any in the text. In both cases of treating pathologies of the

spleen, the author employs the only uses of resistance exercises (cutting wood and wrestling) in the text, as opposed to the more common cardiovascular exercise solely (walking). Resistance exercises are an essential part of modern exercise therapy, being used to build muscular-skeletal strength in patient rehabilitation for a myriad of injuries, diseases and is prescribed as an ongoing practice for health maintenance post-recovery and for general populations.¹⁶⁷

¹⁶⁷ See chapters 8-31 in Ehrman, J. et al. 2023.

Section 3.4: Regimen in Acute Diseases (ΠΕΡΙ ΔΙΑΙΤΗΣ ΟΞΕΩΝ)

Regimen in Acute Diseases is a single bipartite work that is separated into two pieces within the Hippocratic manuscripts. For this reason, it is still separated by translators and commentators into *Acute Diseases A* and *B*. In the Loeb volumes, the *B* section is referred to as *Acute Diseases 'Appendix'*. I demonstrate exhibits of proof from both *A* and *B*.

The text combines concepts present from both the previous works examined so far (*Regimen* and *Internal Affections*), as the author presents the causes, symptoms, and treatments for acute diseases, with a particular emphasis on regimen (*diaita*) in the treatment process. The acute diseases covered have some overlap with the diseases covered in *Internal Affections*, such as with forms of kidney diseases or ‘dropsy’ (see section 3.4.2). In addition to bloodletting, purging, fasting, and to the dietary treatments concerning food and drink, exercise is again prescribed as a therapeutic method. The author also provides another unique statement on the properties of exercise as a means to treat illness, but also to preserve health. For this reason, the remaining passages neatly conclude my consideration of the evidence for EIM in the Corpus.

Acute Diseases 9

This passage provides a different viewpoint of the philosophy behind Hippocratic regimen and its effectiveness on athletes. The examples thus far have explored the use of exercise in Hippocratic regimen as they pertain to treating patients suffering from various pathologies and promoting health. This passage provides another angle to the EIM discussion, as it shows that the rough equivalent of modern sports medicine (i.e. focusing on the physical fitness of athletes) was considered within *Acute Diseases*, with the author catering some advice to athletes (καὶ τοῖσιν ἀσκεύουσιν ἐξ εὐεξίην). In catering this advice to athletes, the author

deviates from focusing solely on health, and moves instead towards ‘good-condition’ (εὐεξίην), a goal outcome of regimen that does not appear in the examples discussed thus far.

In Section 1.2 the connection between medicine and gymnastic exercise is discussed, which includes some contentious views on ‘good condition’. In summary, the connection between athletics and medicine is recognized both within and outside of the Corpus, going back to Herodicus, who has recently been dubbed "the father of sports medicine."¹⁶⁸ However, in contrast to *Acute Diseases*, some Hippocratic authors resisted the assimilation of athletics and medicine, stressing the instability of athletes' εὐεξία, or good condition.¹⁶⁹ In relation to this, views about the aims and functions of Hippocratic medicine and gymnastic exercise differed in some respects, cf. *EN* 1138a29-31: “medicine aims at the healthy and gymnastics at what brings about good condition, both of which are a mean between excess and defect.”¹⁷⁰ Since the author of *Regimen* does not discuss this, and instead attempts to isolate his advice into a solely medical category, we may assume these authors held opposing viewpoints on the assimilation between athletics and medicine, though without explicit condemnation we cannot be certain.

Acute Disease 9 corresponds to Part 3 of the Littré edition.¹⁷¹ The archaic translation of Adams uses Littré’s text, which is identical to the Loeb text for this passage, but fails to properly understand the Greek, missing the translation of εὐεξίην all together. I point this out to encourage the use of reputable translations in future discussions of EIM in Hippocratic Medicine. Cf.

Adams: “I say then, that this question [regimen] is a most excellent one and allied to many others, some of the most vital importance in the art [medicine], for that it can contribute much to

¹⁶⁸ Georgoulis, A.D., Kapidou, I.S., Velogianni, L., Stergiou, N., and Boland, A. 2007:1-10 for this designation. See section 2.2 for some discussion on the historicity of Herodicus as Hippocrates’ teacher, and his role in using exercise in medicine.

¹⁶⁹ Schiefsky, M. 2005:173. Cf. *Aph.* 1.3, L. 4.45 (8.11)- 460.6.

¹⁷⁰ Schiefsky, M. 2005:174.

¹⁷¹ This is referenced in Section 1.2 in citing the 1868 English translation of Charles Darwin Adams used by Tipton, which he uses as evidence for EIM principles in Hippocratic medicine (see Page 10).

the recovery of the sick, and to the preservation of health in case of those gymnastic[athletic] exercises, and is useful to whatever one wish to apply it.”¹⁷² Cf. Jones: “But I am confident that this inquiry is wholly profitable, being bound up with most, and the most important, of the things embraced by the art. In fact, it has great power to bring health in all cases of sickness, preservation of health to those who are well, good condition to athletes in training, and in fact realization of each man’s particular desire.”

Acute Diseases 52

Also in contrast to both *Regimen* and *Internal Affections*, which employ limitations on their exercise recommendations and prescriptions, the author prescribes exercising ‘as much as possible’ (ὡς πλεῖστα πονεῖτω) for the treatment of dropsy. Although the author does not specify the types of exercise that the patient should use, his goal outcome of the prescription is for the patient to be able to withstand ‘up-hill walks’ (ὅπως πρὸς τοὺς ἀνάντεας περιπάτους ἀντέχη). We do not see this variant of walking specified elsewhere, though it would be nearly impossible to avoid walking up-hill in the terrain of Cos when going distances of up to 150 stades (such as with *Internal Affections 12*). However, walking strictly up-hill is far more physically demanding than walking on flat surfaces, with both higher cardiovascular demands and greater activation of the lower limb muscles.¹⁷³ Since the author appears to be familiar with the more physically demanding exercise routines of athletes, this may explain his tendency towards ‘ὡς πλεῖστα πονεῖτω,’ though without specifying the volume, intensity, or duration of his prescription, it is difficult to accurately compare his philosophy to those of *Regimen* and *Internal Affections*.

¹⁷² Translation from Adams, C.D. 1868. *The Genuine Works of Hippocrates*. Hippocrates. New York. Dover.

¹⁷³ See both Eisenberger, L., Mayr, B., Beck, M., Venek, V., Kranzinger, C., Menzl, A., Jahn, I., Sareban, M., Oberhoffer-Fritz, R., Niebauer, J., & Böhm, B. 2022. Assessment of Exercise Intensity for Uphill Walking in Healthy Adults Performed Indoors and Outdoors. *International journal of environmental research and public health*, 19(24), 16662. And Milic, M., Erceg, M., Palermi, S., Iuliano, E., Borrelli, M., Cè, E., Esposito, F., & Padulo, J. 2020. Uphill walking at iso-efficiency speeds. *Biology of sport*, 37(3), 247–253.

Conclusion

In this thesis, I have set out to prove that exercise was used within the Hippocratic Corpus to either promote health or treat illnesses. In doing so, one of my goals has been to demonstrate that the modern ‘exercise is medicine’ (EIM) initiative has precedence in the ancient world, and ancient Greece in particular, dating back to the Hippocratic Period (460-360 BCE). The fields of exercise science, kinesiology, medicine, and physiology have continued a commitment to the belief that physical activity promotes optimal health and is integral in the prevention and treatment of many medical conditions. These same fields have also taken an interest in the history of EIM and have approached the subject using their own methodology and given much more attention to it than classicists. However, I have now applied modern EIM approaches to these texts from within a classical studies framework, with the goal of increasing our understanding of how exercise was used as medicine in the Corpus. By completing this study using a multidisciplinary approach, I hope that this contributes to a greater understanding of the effectiveness of the Hippocratic prescriptions and has properly situated my findings in a modern context. I have also concluded that there is much room for further study into the topic of exercise in Hippocratic medicine, its legacy into late antiquity, and the overall relationship between exercise and health in the ancient world. I hope to encourage further research on this topic with my findings presented here.

In summary, I have found that there are three works within the Hippocratic Corpus which include explicit recommendations or prescriptions, either for the purpose of health promotion or exercise therapy, both of which categories meet the modern criteria of ‘exercise is medicine.’ This includes *Regimen 2* and *62-66*, *Internal Affections 12, 21, 23, 25* and *30*, and *Regimen in*

Acute Diseases 9 and 52. Within these passages, exercise is either believed by the author(s) to be a necessity in the maintenance or promotion of good health, or used as a therapeutic method for the treatment of various pathologies such as consumption, kidney disease, spleen disease, and various forms of dropsy.

Thus, exercise within Hippocratic regimen (*diaita*, or dietetics) is shown to be the same in theory as in practice. The understanding of the benefits and effects of ‘natural’ and ‘violent’ exercises are outlined in *Regimen*, and both types of exercises are prescribed in the treatment of specific diseases in *Internal Affections* and *Acute Diseases*. So, the medical philosophy behind exercise and its purpose within regimen was shared between multiple authors within the Hippocratic ‘School’ during the Hippocratic Period. Walking is the most common exercise prescribed for this purpose, except for in the case of pathologies affecting the spleen, where wrestling and cutting wood are prescribed alongside walking. The Corpus places more importance on walking as a form of exercise than other contemporary Greek sources, prescribing it in both acute and prolonged treatments for certain diseases and as a recommendation for health. Exercise is either recommended for these purposes as part of a tripartite division of *diaita* (regimen), alongside food and drink, or prescribed as an exclusive therapy. Various routines of walking, a ‘natural’ exercise, as described in *Regimen* 61, are prescribed in the treatment of specific diseases and are recommended for the maintenance or promotion of good health, with varying degrees of frequency, based on the tailored needs of the individual. This includes recommendations for tailoring the exercise regimen based on factors such as food intake, age, and environment (climate or weather/time of year).

The methods by which exercise is used in these treatments share fundamental similarities to the modern implementation of clinical exercise, with volume, intensity, frequency, and duration of cardiovascular (walking) or resistance (wrestling and cutting wood) exercises being

specified in many cases with varying degrees of specificity. The observations about the benefits of exercise and their physiological effects also share similarities with those found in modern exercise science, or clinical exercise physiology. These include observations on the ability of cardiovascular exercise to burn fat, improve digestion, improve mental clarity and focus, and of resistance exercise to build muscle. These also include observations on the adaptation to exercise stress and the decrease of delayed-onset-muscle-soreness in subjects who engage in regular repetition of moderate to high intensity exercise.

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Appendix 1: Passages Analyzed in Section 3 (in order of appearance)

Regimen 2

Π. Φημὶ δὲ δεῖν τὸν μέλλοντα ὀρθῶς συγγράφειν περὶ διαίτης ἀνθρωπίνης πρῶτον μὲν παντὸς φύσιν ἀνθρώπου γνῶναι καὶ διαγνῶναι· γνῶναι μὲν ἀπὸ τίνων συνέστηκεν ἐξ ἀρχῆς, διαγνῶναι δὲ ὑπὸ τίνων μερῶν κεκράτῃται· εἴτε γὰρ τὴν ἐξ ἀρχῆς σύστασιν μὴ γνῶσεται, ἀδύνατος ἔσται τὰ ὑπ' ἐκείνων γινόμενα γνῶναι· εἴτε μὴ γνῶσεται τὸ ἐπικρατέον ἐν τῷ σώματι, οὐχ ἱκανὸς ἔσται τὰ συμφέροντα προσενεγκεῖν 10τῷ ἀνθρώπῳ. ταῦτα μὲν οὖν δεῖ γινώσκειν τὸν συγγράφοντα, μετὰ δὲ ταῦτα σίτων καὶ ποτῶν ἀπάντων, οἷσι διαιτώμεθα, δύναμιν ἥντινα ἕκαστα ἔχει καὶ τὴν κατὰ φύσιν καὶ τὴν δι' ἀνάγκην καὶ τέχνην ἀνθρωπίνην. δεῖ γὰρ ἐπίστασθαι τῶν τε ἰσχυρῶν φύσει ὡς χρὴ τὴν δύναμιν ἀφαιρεῖσθαι, τοῖσι τε ἀσθενέσιν ὅπως χρὴ ἰσχὺν προστιθέναι διὰ τέχνης, ὅκου ἂν ὁ καιρὸς ἐκάστωδ' παραγένηται. γνοῦσι δὲ τὰ εἰρημένα οὐπω αὐτάρκης ἡ θεραπείη τοῦ ἀνθρώπου, διότι οὐ δύναται ἐσθίων ὁ ἄνθρωπος ὑγιαίνειν, ἢν μὴ καὶ πονῇ. ὑπεναντίας μὲν γὰρ ἀλλήλοισιν ἔχει τὰς δυνάμεις σῖτα καὶ πόνοι, συμφέρονται δὲ πρὸς ἄλληλα πρὸς ὑγείην· πόνοι μὲν γὰρ πεφύκασιν ἀναλῶσαι τὰ ὑπάρχοντα· σῖτα δὲ καὶ ποτὰ ἐκπληρῶσαι τὰ κενωθέντα. δεῖ δὲ, ὡς ἔοικε, τῶν πόνων διαγινώσκειν τὴν δύναμιν καὶ τῶν κατὰ φύσιν καὶ τῶν διὰ βίης γινομένων, καὶ τίνες αὐτῶν αὔξησιν παρασκευάζουσιν ἐς σάρκας καὶ τίνες ἔλλειψιν, καὶ οὐ μόνον ταῦτα, ἀλλὰ καὶ τὰς συμμετρίας τῶν πόνων πρὸς τὸ πλῆθος τῶν σίτων καὶ τὴν φύσιν τοῦ ἀνθρώπου καὶ τὰς ἡλικίας τῶν σωμάτων, καὶ πρὸς τὰς ὥρας τοῦ ἐνιαυτοῦ καὶ πρὸς τὰς μεταβολὰς τῶν πνεύματων, πρὸς τε τὰς θέσεις τῶν χωρίων ἐν οἷσι διαιτέονται, πρὸς τε τὴν κατάστασιν τοῦ ἐνιαυτοῦ. ἄστρον τε ἐπιτολὰς καὶ δύσιας γινώσκειν δεῖ, ὅπως ἐπίστηται τὰς μεταβολὰς καὶ ὑπερβολὰς φυλάσσειν καὶ σίτων καὶ ποτῶν καὶ πνευμάτων καὶ τοῦ ὅλου κόσμου,

ἐξ ὧν περ τοῖσιν ἀνθρώποισι αἱ νοῦσοι εἰσὶν. ταῦτα δὲ πάντα διαγνόντι οὐπω αὐταρκες τὸ εὖρεμά ἐστιν· εἰ μὲν γὰρ ἦν εὖρετὸν ἐπὶ τούτοις πρὸς ἐκάστου φύσιν σίτου μέτρον καὶ πόνων ἀριθμὸς σύμμετρος μὴ ἔχων ὑπερβολὴν μήτε ἐπὶ τὸ πλεον μήτε ἐπὶ τὸ ἔλασσον, εὖρητο ἂν ὑγείῃ τοῖσιν ἀνθρώποισιν ἀκριβῶς. νῦν δὲ τὰ μὲν προειρημένα πάντα εὖρηται, ὁκοῖά ἐστι, τοῦτο δὲ ἀδύνατον εὖρεῖν.

II. I maintain that he who aspires to treat correctly of human regimen must first acquire knowledge and discernment of the nature of man in general—knowledge of its primary constituents and discernment of the components by which it is controlled. For if he be ignorant of the primary constitution, he will be unable to gain knowledge of their effects; if he be ignorant of the controlling thing in the body he will not be capable of administering to a patient suitable treatment. These things therefore the author must know, and further the power possessed severally by all the foods and drinks of our regimen, both the power each of them possessed by nature and the power given them by the constraint of human art. For it is necessary to know both how one ought to lessen the power of these when they are strong by nature, and when they are weak to add by art strength to them, seizing each opportunity as it occurs. Even when all this is known, the care of a man is not yet complete, because eating alone will not keep a man well; he must also take exercise. For food and exercise, while possessing opposite qualities, yet work together to produce health. For it is the nature of exercise to use up material, but of food and drink to make good deficiencies. And it is necessary, as it appears, to discern the power of the various exercises, both natural exercises and artificial, to know which of them tends to increase flesh and which to lessen it; and not only this, but also to proportion exercise to bulk of food, to the constitution of the patient, to the age of the individual, to the season of the year, to the changes of the winds, to the situation of the region in which the patient resides, and to the

constitution of the year. A man must observe the risings and settings of stars, that he may know how to watch for change and excess in food, drink, wind and the whole universe, from which diseases exist among men. But even when all this is discerned, the discovery is not complete. If indeed in addition to these things it were possible to discover for the constitution of each individual a due proportion of food to exercise, with no inaccuracy either of excess or of defect, an exact discovery of health for men would have been made. But as it is, although all the things previously mentioned have been discovered, this last discovery cannot be made.”

Regimen 62-66

LXII. Οἱ δὲ περίπατοι κατὰ φύσιν μὲν εἰσὶ, καὶ οὗτοι μάλιστα τῶν λοιπῶν, ἔχουσι δέ τι βίαιον. δύναμις δὲ αὐτῶν ἐκάστων τοιήδε· ὁ ἀπὸ δείπνου περίπατος ξηραίνει τὴν τε κοιλίην καὶ τὸ σῶμα, καὶ τὴν γαστέρα οὐκ ἔῃ πείραν γίνεσθαι διὰ τάδε· κινευμένου τοῦ ἀνθρώπου, θερμαίνεται τὰ σιτία καὶ τὸ σῶμα· ἔλκει οὖν τὴν ἰκμάδα ἢ σάρξ, καὶ οὐκ ἔῃ περὶ τὴν κοιλίην συνίστασθαι· τὸ μὲν οὖν σῶμα πληροῦται, ἡ δὲ κοιλίη λεπτύνεται. ξηραίνεται δὲ διὰ τάδε· κινευμένου τοῦ σώματος καὶ θερμαινομένου, τὸ λεπτότατον τῆς τροφῆς καταναλίσκεται, τὸ μὲν ὑπὸ τοῦ συμφύτου θερμοῦ, τὸ δὲ σὺν τῷ πνεύματι ἀποκρίνεται ἔξω, τὸ δὲ καὶ διουρεῖται· ὑπολείπεται δὲ τὸ ξηρότατον ἀπὸ τῶν σιτίων ἐν τῷ σώματι, ὥστε τὴν κοιλίην ἀποξηραίνεσθαι καὶ τὴν σάρκα. καὶ οἱ ὄρθριοι περίπατοι ἰσχυαίνουσι, καὶ τὰ περὶ τὴν κεφαλὴν κοῦφά τε καὶ εὐαγέα καὶ εὐήκοα παρασκευάζουσι, καὶ τὴν κοιλίην λύουσιν· ἰσχυαίνουσι μὲν ὅτι κινεούμενον τὸ σῶμα θερμαίνεται, καὶ τὸ ὑγρὸν λεπτύνεται καὶ καθαίρεται, τὸ μὲν ὑπὸ τοῦ πνεύματος, τὸ δὲ μύσσεται καὶ χρέμπτεται, τὸ δὲ ἐς τὴν τροφήν τῷ τῆς ψυχῆς θερμῷ καταναλίσκεται· τὴν δὲ κοιλίην λύουσιν, διότι θερμῇ ἐούσῃ τοῦ ψυχροῦ πνεύματος ἐπεισπίπτοντος ἄνωθεν, ὑποχωρεῖ τὸ θερμὸν τῷ ψυχρῷ. κοῦφα δὲ τὰ περὶ τὴν κεφαλὴν ποιεῖ διὰ τάδε· ὅταν κενωθῇ ἡ κοιλίη, ἔλκει ἐς ἐωυτὴν ἔκ τε τοῦ ἄλλου σώματος καὶ ἐκ τῆς κεφαλῆς τὸ ὑγρὸν θερμῇ ἐούσῃ. κενουμένης δὲ τῆς

κεφαλῆς, ἀποκαθαίρεται ἢ τε ὄψις καὶ ἡ ἀκοή· καὶ γίνεται εὐαγής. οἱ δὲ ἀπὸ τῶν γυμνασίων περίπατοι καθαρὰ τὰ σώματα παρασκευάζουσι καὶ ἰσχνά, οὐκ ἔδωντες τὴν σύντηξιν τῆς σαρκὸς τὴν ὑπὸ τοῦ πόνου συνίστασθαι, ἀλλ' ἀποκαθαίρουσιν.

LXIII. Τῶν δὲ δρόμων δύνανται οἱ μὴ καμπτοὶ καὶ μακροί, ἐξ ὀλίγου προσαγόμενοι, θερμαίνοντες τὴν σάρκα συνεψεῖν καὶ διαχεῖν, καὶ τῶν σίτων τὴν δύναμιν τὴν ἐν τῇ σαρκὶ καταπέσσουσι, βραδύτερά τε καὶ παχύτερα τὰ σώματα παρασκευάζουσι τῶν τρόχων· τοῖσι δὲ πολλὰ ἐσθίουσι συμφορώτεροι, καὶ χειμῶνος μᾶλλον ἢ θέρεος. οἱ δὲ ἐν τῷ ἱματίῳ δρόμοι τὴν μὲν δύναμιν τὴν αὐτὴν ἔχουσι, θᾶσσον δὲ διαθερμαίνοντες ὑγρότερα τὰ σώματα ποιέουσιν, ἀχρώτερα δέ, διότι οὐκ ἀποκαθαίρει προσπίπτον τὸ πνεῦμα τὸ εἰλικρινές, ἀλλ' ἐν τῷ αὐτῷ ἐγγυμνάζεται πνεύματι· συμφέρει οὖν τοῖσι ξηροῖσι καὶ τοῖσι πολυσάρκοισιν, ὅστις καθελεῖν τὴν σάρκα βούλεται, καὶ τοῖσι πρεσβυτέροισι διὰ ψύξιν τοῦ σώματος. οἱ δὲ δίαυλοι καὶ ὑπὲριοι τὴν μὲν σάρκα ἥσσον διαχέουσιν, ἰσχναίνουσι δὲ μᾶλλον, διότι τοῖς εἴσω τῆς ψυχῆς μέρεσιν οἱ πόνοι ὄντες ἀντισπῶσιν ἐκ τῆς σαρκὸς τὸ ὑγρὸν καὶ τὸ σῶμα λεπτύνουσι καὶ ξηραίνουσιν. οἱ δὲ τρόχοι τὴν μὲν σάρκα ἥκιστα διαχέουσιν, ἰσχναίνουσι δὲ καὶ προσστέλλουσι τὴν τε σάρκα καὶ τὴν κοιλίην μάλιστα, διότι ὀξυτάτῳ τῷ πνεύματι χρώμενοι τάχιστα τὸ ὑγρὸν ἔλκουσιν ἐφ' ἐωυτούς.

LXIV. Τὰ δὲ παρασείσματα ξηροῖσι μὲν καὶ ἐξαπίνης, ἀσύμφορα· σπάσματα γὰρ ἐμποιεῖ διὰ τόδε. τεθερμασμένον τὸ σῶμα, τὸ μὲν δέρμα ἰσχυρῶς λεπτύνει, τὴν δὲ σάρκα ἥσσον συνίστησι τῶν τρόχων, κενοὶ δὲ τὴν σάρκα τοῦ ὑγροῦ. τὰ δὲ ἀνακινήματα καὶ ἀνακουφίσματα τὴν μὲν σάρκα ἥκιστα διαθερμαίνει, παροξύνει δὲ καὶ τὸ σῶμα καὶ τὴν ψυχὴν, καὶ τοῦ πνεύματος κενοὶ. πάλιν δὲ καὶ τρῖνσι τοῖσι μὲν ἔξω τοῦ σώματος παρέχει τὸν πόνον μᾶλλον, θερμαίνει δὲ τὴν σάρκα καὶ στερεοῖ καὶ αὐξεσθαι ποιεῖ διὰ τόδε· τὰ μὲν στερεὰ φύσει τριβόμενα συνίστησι, τὰ δὲ κοῖλα αὐξεται, ὅσαι φλέβες εἰσὶ· θερμαινόμεναι δὲ αἱ σάρκες καὶ ξηραίνόμεναι ἔλκουσιν ἐφ' ἐωυτὰς τὴν τροφήν διὰ τῶν πόρων, εἴτα αὐξονται. ἀλίνδησις παραπλήσια πάλιν διαπρήσσεται,

ξηραίνει δὲ μᾶλλον διὰ τὴν κόνιν καὶ σαρκῶς ἥσσαν. ἀκροχειρισμὸς ἰσχυαίνει καὶ τὰς σάρκας ἔλκει ἄνω, καὶ κωρυκομαχίη καὶ χειρονομίη παραπλήσια διαπρήσσεται. πνεύματος δὲ κατάσχεσις τοὺς πόρους διαναγκάσαι καὶ τὸ δέρμα λεπτῦναι καὶ τὸ ὑγρὸν ἐκ τοῦ δέρματος ἐξῶσαι δύναται.

LXV. Τὰ ἐν κόνει καὶ τὰ ἐν ἐλαίῳ γυμνάσια διαφέρει τοσόνδε· κόνις μὲν ψυχρόν, ἔλαιον δὲ θερμόν· ἐν μὲν τῷ χειμῶνι τὸ ἔλαιον αὐξιμώτερον, διότι τὸ ψῦχος κωλύει φέρειν ἀπὸ τοῦ σώματος· ἐν δὲ τῷ θέρει τὸ ἔλαιον ὑπερβολὴν θερμασίης ποιεῦν τήκει τὴν σάρκα, ὅταν ὑπὸ τῆς ὥρης ἐκθερμαίνεται καὶ τοῦ ἐλαίου καὶ τοῦ πόνου. ἡ δὲ κόνις ἐγγυμνάζεσθαι ἐν τῷ θέρει αὐξιμώτερον· ψύχουσα γὰρ τὸ σῶμα οὐκ ἐᾷ ἐκθερμαίνεσθαι ἐς ὑπερβολήν· ἐν δὲ τῷ χειμῶνι διαψυκτικὸν καὶ κρυμνῶδες· ἐνδιάτριβειν δὲ ἐν τῷ σώματι καὶ ἀπορροῦειν τὴν θερμὴν.

LXVI. Περὶ δὲ κόπων τῶν ἐν τοῖσι σώμασιν γινομένων ὧδε ἔχει· οἱ μὲν ἀγύμναστοι τῶν ἀνθρώπων ἀπὸ παντὸς πόνου κοπιῶσι· οὐδὲν γὰρ τοῦ σώματος διαπεπόνηται πρὸς οὐδένα πόνον· τὰ δὲ γεγυμνασμένα τῶν σωμάτων ὑπὸ τῶν ἀηθῶν πόνων κοπιᾷ· τὰ δὲ καὶ ὑπὸ τῶν συνήθων γυμνασίων κοπιᾷ, ὑπερβολῇ χρησάμενα.

“LXII. Walking is a natural exercise, much more so than the other exercises, but there is something violent about it. The properties of the several kinds of walking are as follow. A walk after dinner dries the belly and body; it prevents the stomach becoming fat for the following reasons. As the man moves, the food and his body grow warm. So the flesh draws the moisture, and prevents it accumulating about the belly. So the body is filled while the belly grows thin. The drying is caused thus. As the body moves and grows warm, the finest part of the nourishment is either consumed by the innate heat, or secreted out with the breath or by the urine. What is left behind in the body is the driest part from the food, so that the belly and the

flesh dry up. Early-morning walks too reduce [the body], and render the parts about the head light, bright and of good hearing, while they relax the bowels. They reduce because the body as it moves grows hot, and the moisture is thinned and purged, partly by the breath, partly when the nose is blown and the throat cleared, partly being consumed by the heat of the soul for the nourishment thereof. They relax the bowels because, cold breath rushing into them from above while they are hot, the heat gives way before the cold. It makes light the parts about the head for the following reasons. When the bowels have been emptied, being hot they draw to themselves the moisture from the body generally, and especially from the head; when the head is emptied sight and hearing are purged, and the man becomes bright. Walks after gymnastics render the body pure and thin, prevent the flesh melted by exercise from collecting together, and purge it away.

LXIII. Of running exercises, such as are not double and long, if increased gradually, have the power to heat, concoct and dissolve the flesh; they digest the power of the foods that is in the flesh, making the body slower and more gross than do circular runnings, but they are more beneficial to big eaters, and in winter rather than in summer. Running in a cloak has the same power, but heating more rapidly it makes the body more moist but less tanned, because this is not cleansed by meeting the rush of pure air, but remains in the same air while it is exercised. So this kind of running is beneficial to those who have a dry body, to those who have excess of flesh which they wish to reduce, and, because of the coldness of their bodies, to those who are getting on in years. The double course, with the body exposed to the air, dissolves the flesh less, but reduces the body more, because the exercises, being concerned with the inner parts of the soul, draw by revulsion the moisture out of the flesh, and render the body thin and dry. Running in a circle dissolves the flesh least, but reduces and contracts the flesh and the belly most, because, as it causes the most rapid respiration, it is the quickest to draw the moisture to itself.

LXIV. Swinging the arms, for persons of dry flesh, and when jerky, is inexpedient, as it causes sprains, in the following way. The body having been warmed, this swinging makes the skin considerably thinner, but contracts the flesh less than running in a circle, and empties the flesh of its moisture. Sparring and raising the body heat the flesh least, but they stimulate both body and soul, while they empty the body of breath. Wrestling and rubbing give exercise more to the exterior parts of the body, but they warm the flesh, harden it and make it grow, for the following reason. Parts that are naturally hard are compressed by rubbing, while hollow parts grow, such as are veins. For the flesh, growing warm and dry, draws to itself the nourishment through the passages, and then it grows. Wrestling in the dust has effects like to those of ordinary wrestling, but it dries more because of the dust, and it increases flesh less. Wrestling with the fingers reduces and draws the flesh upwards; the punch-ball and arm exercises have like effects. Holding the breath has the property of forcing open the passages, of thinning the skin, and of expelling therefrom the moisture.

LXV. Exercises in dust differ from those in oil thus. Dust is cold, oil is warm. In winter oil promotes growth more, because it prevents the cold from being carried from the body. In summer, oil, producing excess of heat, melts the flesh, when the latter is heated by the season, by the oil and by the exercise. In summer it is exercise in dust that promotes growth more, for by cooling the body it prevents its being heated to excess. But in winter dust is chilling, or even freezing. To remain in the dust after exercise in summer benefits by its cooling property, if it be for a short time; if it be for long, it dries the body to excess and renders it hard as wood. Rubbing with oil and water softens the body, and prevents its becoming over-heated.

LXVI. The fatigue pains that arise in the body are as follow. Men out of training suffer these pains after the slightest exercise, as no part of their body has been inured to any exercise; but

trained bodies feel fatigue pains after unusual exercises, some even after usual exercises if they be excessive.”

Internal Affections 12

“όκόταν δὲ ἀναστῇ εὐδων, περιελθέτω σταδίους εἴκοσι τὸ βραχύτατον ταύτη τῇ ἡμέρῃ· τῇσι δὲ ἄλλησι ἡμέρησι πέντε σταδίους ἄλλους ὑπερβαλὼν βαδιζέτω ἐκάστης ἡμέρης ἕως ἂν ἀφίκηται ἐς τοὺς ἑκατὸν σταδίους. τὴν δὲ κοιλὴν ὑποκαθαίρειν δεῖ ἐκ τῆς ἡμέρης χυλοῖσι τεύτλων καὶ ἀπὸ κράμβης· χωρὶς ἐκάτερα ἐψησας ἀπηθῆσαι χοεᾶ ἐκατέρου· εἴτα συμμίζας ἐς τὸ αὐτὸ συνεψεῖν δὲ οἶος στέαρ τὸ ἀπὸ τῶν νεφρῶν τεταρτημόριον μνάς ἐν ἀμφοτέροις· ἐψεῖν διελὼν· όκόταν δὲ μέλλῃ πιεῖσθαι, πρὸς μὲν τῆς κράμβης τὸν χυλὸν ἄλλα παραβαλεῖν, πρὸς δὲ τὸν τῶν τευτλίων μέλι παραχέειν, εἴτα χωρὶς ἐκάτερον πίνειν· ἢ μέλι παραχέας παρὰ τὴν ἐτέρην κύλικα [καί] πίνειν, παρὰ δὲ τὴν ἐτέρην ἄλας· ἐκπιεῖν δὲ χρὴ πάντα τὸν χυλόν.

Ταῦτα μὲν ποιεῖν χρὴ τριήκοντα ἡμέρας. τῷ δὲ δευτέρῳ μηνὶ ἐσθιέτω ἄρτον καὶ κρέα πίονα ὕος ἐφθά, ἄλλο μηδέν· οἶνον δὲ πινέτω λευκόν, αὐστηρόν, καὶ ὁδὸν ὁδοιπορεέτω μὴ ἐλάσσω σταδίων τριήκοντα πρὸ τοῦ δείπνου, μετὰ δὲ τὸ δεῖπνον δέκα· καὶ μὴ ῥιγούτω, ἀλλ’ ἐσκεπάσθω. ταῦτα ἦν ποιέη ῥήϊον οἶσει τὴν νοῦσον.

Τῷ δὲ τρίτῳ μηνὶ κυκεῶνα ἀνθινὴν πινέτω· σελίνου ῥίζας καὶ ἄνηθον καὶ πήγανον καὶ μίνθην καὶ κορίαννον καὶ μήκωνας ἀπαλὰς καὶ ὄκιμον καὶ φακὸν καὶ ῥοιῆς γλυκεῖας καὶ οἰνώδεος χυλόν· εἶναι δὲ χρὴ τὰς γλυκείας διπλασίας· εἶναι δὲ χρὴ συναμφοτέρων τοῦ χυλοῦ ἡμικοτύλιον καὶ οἶνου μέλανος ἡδέος αὐστηροῦ ἡμικοτύλιον καὶ ὕδατος κατύλης ἡμισυ· ἔπειτα ἄνθεα τρίψας λεῖα, διῆναι τούτῳ τῷ συγκεκριμένῳ, καὶ ἐγγέαι ἐς κύλικα· ἔπειτα ἐπιβαλεῖν ἄλευρα ὀρόβων, ὁκόσον ὀξύβαφον, καὶ ἄλφιτον ἴσον, καὶ τυροῦ παλαιοῦ αἰγείου ξέσας τὸ ἴσον τοῖσι ὀρόβοις· ταῦτα συγκυκῆσας ἐκπιέτω· ἔπειτα διαλιπὼν ὀλίγον χρόνον ἀριστάτω ἄρτον, καὶ ὄψον ἐχέτω

τέμαχος νάρκης ἢ ρίνης ἢ γαλεοῦ ἢ βατίδος, καὶ κρέα οἶδς ἐσθιέτω ἐφθά· καὶ παχυνέτω ἐωυτὸν ἡσυχίην ἄγων ὡς μάλιστα· καὶ πυριῖν διὰ δεκάτης ἡμέρης [ἐς ἐωυτὸν ἡσυχῇ].

Τῷ δὲ τετάρτῳ μηνὶ πυριῖν διὰ πέμπτης ἡμέρης ἀτρέμα, καὶ ἐσθιέτω ὄψον ὡς πλεῖστον· ὄψω δὲ χρεέσθω τυροῖσι καὶ κρέασι ὀλίγοις οἶδς ἐφθοῖσι. ὁδοιπορεέτω δὲ σταδίους οὗτος τῷ τετάρτῳ μηνὶ ἀρξάμενος τῇ πρώτῃ ἡμέρῃ ἀπὸ δέκα σταδίων, μέχρις ὀγδοήκοντα αὐτῷ στάδιοι γέγονται· περιπατεέτω δὲ τῆς ἡμέρης ὀγδοήκοντα σταδίους, μετὰ τὸ δεῖπνον εἴκοσιν, ὄρθρου δὲ τριήκοντα.

Τὸ δὲ λοιπὸν τοῦ χρόνου διαιτάσθω μᾶζαν καὶ ἄρτον ἐσθίων ἀμφοτέρω· καὶ ὄψον ἐχέτω σελάχια, καὶ κρέα πάντα ἐσθιέτω πλὴν βοείων καὶ χοιρείων· ἰχθύων δὲ τῶνδε ἀπεχέσθω, κεστρέος καὶ ἐγγέλλου καὶ μελανούρου· ἐσθιέτω δὲ νάρκην καὶ ρίνην καὶ βατίδα καὶ γαλὸν καὶ τρυγὸνα καὶ βατράχους, τῶν δὲ λοιπῶν μηδένα. ἦν δὲ δοκέῃ ἀσινέα εἶναι, καὶ κυκεῶνα, ἐπειδὴν μέλλῃ καθευδήσειν, πινέτω ἀπὸ οἴνου μέλανος, ἡδέος, παλαιοῦ, δικότυλον κύλικα· καὶ μεθ' ἡμέρην τῷ αὐτῷ οἴνῳ χρεέσθω ἐπὶ σιτίῳ. καὶ ὁδοιπορεέτω τῆς ἡμέρης, ἑκατὸν πεντήκοντα σταδίους, μετὰ δεῖπνον εἴκοσι, ὄρθρου δὲ τεσσεράκοντα. οὗτος γίνεται ὑγιὲς μάλιστα ἐνιαυτῷ οὕτῳ θεραπευόμενος.”

“On arising from his sleep, have him walk at least twenty stades that day; on the days that follow, let him walk an additional five stades each day until he reaches one hundred stades. Beginning from the first day, you must clean the cavity downwards with beet- and cabbagejuice: boil these separately, and strain off a chous of each; then mix into each one quarter mina of fat from a sheep’s kidney, and boil them, still separately; when the patient is ready to drink, into the cabbage-juice sprinkle salt, and into the beet-juice pour honey; then have him drink each separately; alternatively add honey to one cup and have him drink it, and then salt to the next cup; he must drink all the juice. These things you must do for thirty days. In the second month,

let the patient eat bread and boiled fat pork, but nothing else; let him drink dry white wine, and walk a distance of not less than thirty stades before dinner, and after dinner ten stades; let him keep himself covered in order to avoid a chill. If he does these things, he will bear the disease more easily. In the third month, let the patient drink a cyceon flavoured with plants: celery roots, dill, rue, mint, coriander, fresh poppies, basil, lentil, and the juices of sweet and vinous pomegranates, the amount of the sweet being double that of the vinous; there must be a half cotyle of the two juices together, a half cotyle of pleasant dry dark wine, and a half cotyle of water. Grind the plants fine, soak them in this mixture, and pour into a cup. Then add vetch-meal to the amount of an oxybaphon, an equal amount of barleymeal, and grate in an amount of aged goat's cheese equal to the vetches. Stir all these into the cyceon, and have the patient drink it off. Then, leaving a short interval, let him breakfast on bread, take as main dish a slice of torpedo, angel-fish, dogfish or skate, and eat boiled mutton; let him fatten himself by keeping very quiet; administer a vapourbath every tenth day. In the fourth month, administer mild vapour-baths every fifth day, and let the patient eat main dishes as much as he can; as such employ cheeses and small amounts of boiled mutton. Let this patient walk stades in the fourth month, beginning on the first day with ten stades, and increasing until he reaches eighty stades; then let him walk eighty stades daily, of which twenty should be after dinner and thirty in the morning (sc. the other thirty between his meals). From then on, let the regimen include eating both barley-cakes and bread; let the patient take as main dish selachians and eat all meats except beef and pork; of fish, let him abstain from grey mullet, eel and black-tail, and eat torpedo, angel-fish, skate, dogfish, sting-ray and fishingfrog, but no others. If he seems quite well, let him also drink a cyceon, when he is about to retire, a two-cotyle cup made from pleasant old dark wine; by day, let him use this same wine with his meal. Have him walk one hundred and fifty stades a day, of

which twenty should be after dinner and forty in the early morning. When treated in this way, the patient usually recovers in a year.”

Internal Affections 21:

21. “Ἦν δὲ τύχη παλαιότερον ἔὼν τὸ φλέγμα—λευκὸν δὲ καλέεται τοῦτο τὸ φλέγμα—πάσχει τάδε· βαρύνει τὸν ἄνθρωπον μᾶλλον, καὶ ἰδέην ἔχει ἀλλοίην τοῦ ἐπιδημίου. ὠχρότερός τέ ἐστι, καὶ οἰδέει διὰ παντὸς τὸ σῶμα, καὶ τὸ πρόσωπον ἐρεύθει, καὶ τὸ στόμα ξηρόν, καὶ δίψα ἔχει, καὶ ὅταν φάγη, τὸ πνεῦμα πυκινὸν ἐπιπίπτει αὐτῷ. οὗτος αὐτῆς τῆς ἡμέρης τότε μὲν γίνεται ῥάων, τότε δὲ πονέει ἐξαπίνης καὶ δοκέει ἀποθανεῖσθαι. τούτῳ ἦν μὲν ἡ γαστήρ αὐτομάτη ταραχθῆ, ἐγγυτάτω ὑγιῆς προβαίνει.

“Ἦν οὖν μὴ ταραχθῆ αὐτομάτη ἡ κοιλίη, καθαίρειν χρή διδόντα τοῦ κνεώρου ἢ τοῦ Κνιδίου κόκκου ἢ τοῦ ἱππόφεω ἢ τῆς Μαγνησίης λίθου· καὶ μετὰ τὴν κάθαρσιν ῥυφεῖν δοῦναι φακῆς τρυβλίον ἐν ἡ δύο, συνεψέσθω δὲ τῇ φακῇ σκόροδα· καὶ σεύτλου λιπαροῦ ἀνηδύντου, ἐπ’ ἀλφίτων περιπάσαντα, δοῦναι τρυβλίον.

πινέτω δὲ οἶνον μέλανα αὐστηρὸν ἰσχυρόν. τῇ δ’ ὑστεραίῃ περιπατησάτω σταδίους εἴκοσι τὸ ἑωθινόν· ἐλθὼν δὲ φαγέτω ἄρτον μικρὸν ἔξοπτον, καὶ ὄψον ἐχέτω σκόροδα ὀπτά· καὶ πινέτω τοῦ αὐτοῦ οἶνου ὀλίγον ἀκρητέστερον. ἔπειτα βαδιζέτω σταδίους τριήκοντα, καὶ ὅταν ὥρῃ ἢ δείπνου, δειπνήτω ὅσον | περ καὶ ἡριστήκει, ὄψον δ’ ἐχέτω μάλιστα μὲν πόδα ὑὸς καὶ κεφάλαια. εἰ δὲ μή, ἀλεκτρυόνος κρέα ἢ ὑὸς· τετρυμένοισι δὲ καὶ ἐφθοῖσι χρήσθω· ἰχθύων δὲ σκορπίῳ ἢ δράκοντι ἢ κόκκυγι ἢ καλλιωνύμῳ ἢ κωβιῷ ἢ τῶν ἄλλων ἰχθύων ὅσοι τὴν αὐτὴν δύναμιν ἔχουσι· λαχάνων δὲ σκορόδοισι χρήσθω καὶ ἄλλῳ λαχάνῳ μηδενὶ χρήσθω. ταῦτα δὲ ὡς πλεῖστα τρωγέτω καὶ ὠμὰ καὶ ὀπτά καὶ ἐφθά. καὶ ἐσθιέτω αἰεὶ πλείω ἐκάστης ἡμέρης, καὶ ταλαιπωρεῖτω πρὸς τὰ σιτία τεκμαιρόμενος καὶ ὀλίγῳ πλείω.

Τοῦτο τὸ νόσημα γίνεται μάλιστα θέρεος ὥρη ἀπὸ ὑδροπωσίης καὶ ὕπνου· κρίνεται δ' ἐν τριήκοντα ἡμέρησιν, εἰ θανάσιμον ἢ οὐ. ταῦτα μὲν ποιεῖτω ὅταν αἱ τριάκοντα ἡμέραι παρέλθωσιν. ἐν δὲ τῇσι πρώτῃσι τῶν ἡμερέων ῥυφήματι διαχρήσθω φακῇ λεπτῇ ἐπωκεστέρα τῷ ὄξει, καὶ πτισάνῃ ὀξέῃ· πινέτω δὲ χλιαρὸν μελίκρητον, ἄλφιτα ἐπιβάλλων ὀλίγα, ἵνα ἀνωργασμένον τὸ σῶμα ἦ πρὸς τὴν φαρμακοπωσίην· καὶ εὐδέτω ὑπαίθριος ταύτας τὰς ἡμέρας. καὶ ἥν σοι δοκέῃ τοῦ αἵματος ἀφελεῖν ἀπὸ τῆς ὀσφύος, σικύην προσβάλλειν, καὶ τὰς ἐν ὄσχῃ φλέβας σχάσον τὰς παχυτάτας. οὗτος οὕτω θεραπευόμενος τάχιστα ὑγιὲς ἔσται.

21. If the phlegm happens to be of longer duration— this phlegm is called white—the person suffers the following: he is afflicted more intensely, and has different signs than in the common variety of the disease; he is paler, his body swells up all over, his face becomes red, his mouth is dry, he is thirsty, and when he eats anything rapid breathing comes over him. In the course of the same day, this patient is at one time better, but at another time suddenly suffers an attack and seems about to die. If his belly has a spontaneous movement, he proceeds to health very quickly. However, if the cavity does not have a spontaneous movement, you must clean it out by giving spurge-flax, Cnidian berry, hippopheos or magnetic stone; after the cleaning, give one or two bowls of lentil-soup with boiled garlic, to drink; also give a bowl of unseasoned beets boiled in grease, over which you have sprinkled meal. Let the patient drink strong dry dark wine. On the next day, have him walk twenty stades early in the morning, and, on coming back, eat a small loaf of well-baked bread, as main dish have baked garlic, and drink a little of the same wine, mixed with a very little water. Then let him walk thirty more stades, and, when it is dinner time, eat as much for dinner as he had for breakfast; as main dish let him best have feet and head-parts of a swine; if not that, the meat of fowl or swine—let him employ these ground and boiled; also

of fish scorpion fish, weever, piper, star-gazer, goby or others of the same nature; of vegetables let him employ only garlic, but of these eat as many as possible, raw, baked and boiled. Each day have him eat more, and also exert himself a little more, determining how much according to his food.

This disease occurs mainly in summer from drinking water and from sleeping; thirty days are the critical period that decide whether or not the patient will die. Do the following when the thirty days have passed: on the first days, have the patient regularly take as gruel thin lentil-soup well acidified with vinegar, and acid barley-water; let him drink cool melicrat over which a little meal has been sprinkled, in order that his body will be relaxed for a medication; also let him sleep outdoors on these days. If it seems advisable to you to draw blood from the loins, apply a cupping instrument and slit the widest vessels of the scrotum. If this patient is treated in such a way, he will very quickly recover.

Internal Affections 25:

25. Ὅδε δὲ ὁ ὕδερὸς ἀπὸ τοῦ σπληνὸς γίνεται ἀπὸ τῆσδε τῆς προφάσιος μάλιστα· ὅταν ὀπώρη ᾗ καὶ αὐτῆς φάγη πολλὴν σύκων χλωρῶν καὶ μήλων. πολλοὶ δὲ ἤδη βότρυας πολλοὺς καταφαγόντες καὶ γλεῦκος πίνοντες τὴν νοῦσον ἔλαβον.

Ἦν οὖν μέλλῃ ἐς τὸ νόσημα ἐμπεσεῖσθαι, παραχρῆμα ἐν τοῖσι πόνοισιν ἐστίν· ὀδύναι τε γὰρ ὀξέαι ἐν τῷ σπληνὶ καθεστᾶσι, μεταπίπτουσι δὲ καὶ ἐς τὸν ὥμον καὶ ἐς τὴν κληῖδα καὶ ἐς τὸν τιτθὸν καὶ ἐς τὴν λαγόνα· καὶ πυρετοὶ ἰσχυροὶ ἔχουσι· καὶ ἦν φάγη τι, ἡ γαστήρ πίμπραται· καὶ ὁ σπλὴν αἰεῖρεται καὶ ὀδύνην παρέχει. τούτῳ ἦν χρονισθῇ τὸ νόσημα, τὸν μὲν ἄλλον χρόνον οὐ πονέει, ὅταν δὲ ἡ ὀπώρη ᾗ καὶ φάγη αὐτῆς, τότε πονέει μάλιστα.

Τοῦτον, ὅταν οὕτως ἔχη, κατ' ἀρχὰς μελετᾶν, ἄνω μὲν ἐλλέβορον διδοῦς, κάτω δὲ κνέωρον ἢ ἱππόφω ὀπὸν ἢ κόκκον Κνίδιον· διδόναι δὲ καὶ ὄνειον γάλα ἐφθὸν ὀκτὼ κοτύλας μέλι

παραχέας. καὶ ἥν μὲν ὑπὸ τούτων καθίστηται, ἄλλις· ἥν δὲ μή, ὅταν μέγιστος ᾗ ὁ σπλὴν καὶ οἰδέη
μάλιστα, καῦσαι μύκησι, τὰς κεφαλὰς πολλὰς ἀπολαβών, ἢ σιδηρίοισι, φυλασσόμενος ὅπως μὴ
πέρην διακαύσης. ταῦτα μὲν κατ' ἀρχὰς ποιεῖν τοῦ νοσήματος· καὶ διαίταν τήνδε
προσφέρεσθαι, πυρετοῦ μὴ ἔχοντος· ἄρτω μὲν χρῆσθω πυρίνῳ· | ὄψον δ' ἐχέτω τάριχον
Γαδειρικὸν ἢ σαπέρδην, καὶ κρέας τετρυμένον οἰός, καὶ τὰ ὀξέα καὶ τὰ ἀλμυρὰ πάντα ἐσθιέτω,
καὶ πινέτω οἶνον Κῶνον αὐστηρὸν ὡς μελάντατον· τῶν δὲ γλυκέων ἀπεχέσθω. ἥν δ'
ἐξάνιστηται καὶ δυνατὸς ᾗ, παλαιέτω ἀπ' ἄκρων τῶν ὤμων, καὶ ταλαιπωρεῖτω περιόδοις
πολλῇσι δι' ἡμέρης, καὶ εὐωχέισθω ἃ προεῖρηται μάλιστα.
Ἦν δὲ ὕδερὸς ἐπιγένηται, ἰᾶσθαι κατὰ ταῦτα καὶ τοῖς αὐτοῖσι καθάπερ τοὺς πρόσθεν.

25. The next dropsy arises from the spleen, most often in the following way: when in late summer a person eats a lot of the season's fruits such as green figs and apples; many persons have also taken the disease after eating too many grapes and drinking grape-juice.

If, then, a person is about to fall into the disease, he is at once subject to its sufferings; for sharp pains occupy his spleen, and also migrate to his shoulder, collar-bone, nipple and flank, there are violent fevers and, if the patient eats anything, his belly is distended; his spleen swells up and is painful. If the disease becomes prolonged in this patient, at other times of the year he is free of pain, but, when late summer arrives and he eats its fruits, his suffering is great.

When the case is such, at the beginning treat the patient by giving him hellebore to clean upwards, and spurge-flax, hippopheos or Cnidian berry to clean downwards; also give him eight cotylai of boiled ass's milk with honey. If, with this treatment, the disease settles down, fine. If not, when the spleen is at its greatest size and most swollen, cauterize it with fungi, holding their many heads away from the spleen, or with irons, taking care not to burn right through. Do these things at the beginning of the disease. If there is no fever, prescribe the following regimen: let

the patient eat wheat bread; as main dish have Cadiz salt-fish or saperdes, and ground mutton; eat all acid and salty foods; drink dry very dark Coan wine, and abstain from sweets. If he gets up, and is able, let him wrestle with the tips of his shoulders, and exert himself through the day with frequent walks; also feed him well, mainly on what has been mentioned above.

If dropsy is present, treat it according to the same principles and with the same things used for the preceding patients.

Internal Affections 30:

30. Σπληνὸς ἡ πρώτη· γίνεται δὲ διὰ θερμασίην τοῦ ἡλίου, χολῆς κινηθείσης, ὅταν ἐλκύσῃ ὁ σπλήν ἐφ' ἐωυτὸν χολήν. πάσχει τάδε· πυρετὸς ὁξὺς ἐπιγίνεται κατ' ἀρχὰς· προϊούσης δὲ τῆς νούσου ἀφίησι, πλὴν κατ' αὐτὸν τὸν σπλῆνα· ταύτῃ δὲ αἰεὶ θερμὴ ἔχει. καὶ ὀδύνη ἄλλοτε καὶ ἄλλοτε ἐμπίπτει ὁξέῃ καὶ ἐς τὴν λαπάρην καὶ ἐς τὴν κοιλίην. τὰ δὲ σιτία κατ' ἀρχὰς προσίεται μὲν, διαχωρεῖ δὲ οὐ μάλα· προϊούσης δὲ τῆς νούσου, ἢ τε χροίη ὠχρὴ γίνεται, καὶ ὀδύνη ἰσχυρὴ ἐπιπίπτει, καὶ αἱ κληῖδες λεπτύνονται, καὶ τὰ σιτία οὐχ ὁμοίως προσίεται ὥσπερ κατ' ἀρχὰς, καὶ ἀπὸ ὀλίγου πίμπλαται. ὁ δὲ σπλήν μέγας ἄλλοτε αὐτῆς τῆς ἡμέρης, ἄλλοτ' ἐλάσσων γίνεται. Τοῦτον, ὅταν οὕτως ἔχη, πῖσαι ἐλλέβορον, κάτω δ' ὑποκαθῆραι Κνιδίῳ κόκκῳ· ἐς ἐσπέρην δὲ μετὰ τὴν κάθαρσιν φακῆς τρυβλίον δοῦναι ὁξυτέρης, καὶ τευτλίων τρυβλίον λιπαρῶν, ἄλφιτα περιπάσας. τῇ δ' ὑστεραίῃ καὶ τῇ τρίτῃ ἄρτον σμικρὸν δοῦναι· ὄψω δὲ φακῇ χρήσθω καὶ οἶδος κρέη ἐν τῇ φακῇ ἐφθῶ τετρυμένῳ· οἶνον δὲ πινέτω αὐστηρόν, μέλανα, ἀκρητέστερον κατ' ὀλίγον, καὶ ἡσυχίην ἐχέτω ταύτας τὰς ἡμέρας, πλὴν ἔνδον ὀλίγα περιπατεῖτω ἐν σκιῇ. τὸν δὲ λοιπὸν χρόνον τάδε χρὴ προσφέρεσθαι· σίτων μὲν ἄρτον αὐτοπυρίτην, ὄψον δ' ἐχέτω κρέας κυνὸς μέζονος ἢ οἶδος ἢ αἰγὸς τετρυμένον καὶ τάριχον Γαδειρικὸν 246ῃ σαπέρδην. καὶ τὰ ὁξέα καὶ τ' ἄλμυρά πάντα προσφερέσθω καὶ τὰ στρυφνά· πινέτω δὲ οἶνον Κῶν ὑπόστρυφνον ὡς μελάντατον. τῶν δὲ γλυκέων καὶ λιπαρῶν καὶ κνισωδέων ἀπεχέσθω, καὶ σίλφιον μὴ

προσφερέσθω, μηδὲ κρέας ὕειον, μηδὲ κεστρέα μηδὲ ταρίχηρον μήτε νεαρόν, μήτε ἔγγελυν,
μήτε λάχανον μηδὲν ἄνευ ὄξους. τρωξίμων δὲ ῥαφανίδι χρήσθω καὶ σελίνῳ καὶ ἐς ὄξος βάπτων·
καὶ οἶνῳ ἄλφιτα φυρῶν ἐσθίειν, καὶ τοῦ οἴνου ἐπιρυφείτω ἄκρητον· ἣν δὲ βούληται, καὶ τὸν
ἄρτον ἐς τὸν οἶνον ἐνθρυπτόμενον ἐσθιέτω θερμόν· διδόναι δὲ καὶ ἰχθύων σκορπίον, κόκκυγα,
κωβιόν, δράκοντα, καλλιώνυμον, τούτους ἐφθούς καὶ ψυχρούς.

Διδόναι δὲ καὶ ἃ μέλλει τὸν σπλῆνα ἰσχυαίνειν ἐκάστης ἡμέρης, ἀσφοδέλου τὸν καρπὸν, ἣ
κισσοῦ²⁸¹ τὰ φύλλα, ἣ αἰγὸς κέρας, ἣ ἄγνου καρπὸν, ἣ πήγανον, ἣ διδυμαίου ῥίζαν· τούτων
τρίβων ὅ τι ἂν βούλη, διδόναι ἐν οἶνῳ κοτύλῃ αὐστηροῦ νήσται. ἣν δὲ δυνατὸς ἦ, ἀνάγκα αὐτὸν
πρίειν ξύλα τριήκοντα ἡμέρας· καὶ ἀπ' ἄκρων τῶν ὠμων παλαιέτω, καὶ περιπατεῖτω δι' ἡμέρης,
καὶ ὄψιος εὐδέτω, πρώϊος δ' ἐγειρέσθω, καὶ εὐωχεῖσθω τὰ προειρημένα. ἣν δὲ μὴ ὑπὸ τούτων
ῥαίξῃ, καῦσαι τὸν σπλῆνα μύκησι δέκα ἐσχάρας μεγάλας, ὅταν μέγιστος ἦ ὁ σπλήν καὶ
ἐξηρμένος μάλιστα· ἣν γὰρ τύχῃς καύσας, ὑγιᾶ ποιήσεις ἐν τάχει.

Ἡ δὲ νοῦσος δεῖται θεραπείης· χαλεπὴ γὰρ καὶ χρόνιος, ἣν μὴ παραχρῆμα μελετηθῇ.

30. First disease of the spleen: this disease arises from the heat of the sun, when bile is set in motion and the spleen draws it to itself. The patient suffers the following: sharp fevers set in at the outset but, as the disease advances, these abate, except at the site of the spleen itself; there heat is always present; sharp pains also attack from time to time, in both the flank and the cavity. At the beginning, the patient accepts his food, but does not pass it through very well; as the disease progresses, his colour becomes pale-yellow, violent pain besets him, his collarbones become lean, he no longer accepts his food as he did at the beginning, but now becomes full on a little; on one and the same day the spleen is at one time large, at another time smaller.

When the case is such, have the patient drink hellebore, and clean him downwards with Cnidian berry; towards evening after the cleaning, give a bowl of quite acid lentil-soup, and a bowl of beets boiled in grease, over which meal has been sprinkled. On the second and third days, give a small loaf of bread, and let the patient employ as main dish lentil-soup with boiled ground mutton in it; let him drink dark dry wine, quite unmixed with water, a little at a time, and rest on these days except for walking a little inside in the shade. From then on, the following must be administered: of cereals let the patient have whole-wheat bread, as main dish ground meat of an adult dog, sheep or goat, and Cadiz salt-fish or saperdes; administer all the acid and salty foods, and also the sour ones. Let the patient drink very dark sour Coan wine. Have him abstain from foods that are sweet, fat, and that steam like roasted meat, and do not administer silphium, pork, grey mullet either salted or fresh, eel, or any vegetable without vinegar. Of raw vegetables let the patient employ radishes and celery, dipping them in vinegar; also let him eat meal mixed with wine, and afterwards drink pure wine; if he wishes, let him eat bread warm, crumbled into wine; of fish give scorpion fish, piper, goby, weever, and star-gazer, these boiled and cold.

Give medications to strengthen the spleen daily: asphodel seeds, ivy leaves, goat's horn, chaste-tree seed, rue, or orchis root: grind whichever of these you wish, and give it in a cotyle of wine to the fasting patient. If he is able, he must saw wood for thirty days; let him also wrestle with the tips of his shoulders, take walks all through the day, go to sleep late, be awakened early, and be well fed on the things mentioned above. If the person does not improve with these measures, cauterize his spleen with fungi, making ten large eschars when the spleen is largest and most raised; for, if you succeed in your cautery, you will quickly make him well. The disease requires attention, for it lasts a long time and is severe if not cared for at once.

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IX. Φημὶ δὲ πάγκαλον εἶναι τοῦτο τὸ σκέμμα· καὶ ἡδελφισμένον τοῖσι πλείστοισι τῶν ἐν τῇ τέχνῃ καὶ ἐπικαιροτάτοισι· καὶ γὰρ τοῖσι νοσέουσι πᾶσιν ἐς ὑγίειν μέγα τι δύναται καὶ τοῖσιν ὑγιαίνουσιν ἐς ἀσφάλειαν καὶ τοῖσιν ἀσκέουσιν ἐς εὐεξίην καὶ ἐς ὅ τι ἕκαστος ἐθέλει.

IX. But I am confident that this inquiry is wholly profitable, being bound up with most, and the most important, of the things embraced by the art. In fact, it has great power to bring health in all cases of sickness, preservation of health to those who are well, good condition to athletes in training, and in fact realization of each man's particular desire.

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“Υδρώπων δύο μὲν φύσεις, ὧν ὁ μὲν ὁ ὑπὸ τῇ σαρκὶ | ἐγχειρέων γίνεσθαι ἄφυκτος, ὁ δὲ μετ’ ἐμφυσημάτων πολλῆς εὐτυχίης δεόμενος, μάλιστα μὲν ταλαιπωρίας καὶ πυρίης καὶ ἐγκρατεΐης. ξηρὰ δὲ καὶ δριμέα ἐσθιέτω· οὕτω γὰρ ἂν οὐρητικώτατος εἴη καὶ ἰσχύοι μάλιστα. ἤν δὲ δύσπνους γένηται καὶ ἡώρα θερινὴ ἐοῦσα τύχη καὶ ἡ ἡλικίη ἀκμάζει, ἀπὸ τοῦ βραχίονος αἷμα ἀφαιρεῖν· εἶτα θερμοὺς ἄρτους ἐξ οἴνου μέλανος καὶ ἐλαίου | ἀποβάπτων ἐσθιέτω καὶ ὥς ἐλάχιστα πίνων ὥς πλεῖστα πονεῖτω. καὶ κρέα ὕψια σαρκώδεα ἐσθιέτω ἐξ ὄξους ἐφθά, ὅπως πρὸς τοὺς ἀνάντεας περιπάτους ἀντέχη.”

“Of dropsies there are two forms: the one, attacking beneath the tissues, is inescapable; the other, accompanied by tympanites, requires very good fortune, and above all exercise, vapour-baths, and self-control. Let the patient eat foods that are dry and sharp, for thus will he pass the most urine, and have the greatest strength. If he has difficulty breathing, it happens to be the summer season, and he is in the prime of life, draw blood from his arm. Then let him eat warm bread dipped in dark wine and olive oil, drink as little as possible, and exercise himself as much as possible. Have him eat lean pork, boiled in vinegar, in order to be able to withstand up-hill walks.”

