

Cardiology in Ancient India: A Study with Special Reference to the Kushana Period

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Abstract: *Cardiology, as a branch of medicine, is a subject that has a long history in ancient India with a large amount of medical observation, physiology, diagnosis and treatment. Despite the modernity of cardiology as a medical specialty, ancient Indian medical text books provide valuable discussions on the heart (hṛdaya), blood, pulse, respiration, vital functions and bodily channels (srotas). The present paper looks into the knowledge about the cardiovascular system in ancient India focusing at the Kushana era. It is based on the Caraka Saṃhitā, Suśruta Saṃhitā, the Buddhist medical traditions and the classical sources related to them. Conceptualization of the heart as a vital organ, role of prāṇa and vāta, movement of bodily substances, observation of the pulse, hydroga and surgical knowledge about vital structures are given special attention. The study suggests that in ancient medicine in India they didn't form a new branch of medicine known as cardiology but rather had a holistic understanding of cardiac medicine in Ayurveda. During the Kushana period, cultural interactions, the development and dissemination of medical knowledge took place particularly across South and Central Asia.*

Keywords: Ancient Indian medicine, Cardiology, Heart, Hṛdaya, Kushana period, Ayurveda, Caraka, Suśruta, Pulse, Srotas, Medical history.

I. INTRODUCTION

Medical history is a record of not only the treatment of illness, but also of the various understandings of the human body and what its functions are that different civilisations had. The role of the heart in the medical traditions must have been prominent due to its connection with life, consciousness, respiration, circulation, and emotional processes. In spite of the sophistication of modern day cardiology encompassing advanced ideas of anatomy, physiology, pathology, pharmacology and diagnostic technologies, the old Indian medicine had its own systematic concepts on heart and related physiological processes.

In classical Ayurvedic writings, the Sanskrit word hṛdaya is used a lot and denotes the heart. It was an important organ in ancient Indian medicine as being related to prāṇa, circulation, consciousness and the flow of vital body substances. Vāta, rakta, srotas and pulse observation are concepts which show an attempt to explain the functioning of the internal organs.

The Kushana period is also considered to be very important as there was a lot of cultural and intellectual interaction between South Asia, Central Asia and other areas. Knowledge transfer was made possible through the Buddhist networks and trade routes. But in ancient India, there was no separate division of cardiology. Hence, the study is focussed on the cardiovascular related knowledge in the context of Ayurvedic and ancient Indian medical thoughts.

II. OBJECTIVES OF THE STUDY

The principal objectives of this study are:

1. To discuss about the heart in ancient Indian medical system.

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766

2. To examine the ayurvedic classical texts to analyse the cardiac and circulatory functions.
3. To analyze the medical knowledge of Kushana era.
4. To understand the concept of prāṇa, vāta, blood, pulse and srotas in ancient India in relation to the cardiovascular functions.
5. To recognize descriptions of symptoms and disorders that could be mistaken for cardiovascular-related symptoms.
6. To explore how surgical and clinical practices have influenced knowledge about vital organs.

III. REVIEW OF LITERATURE

Yadav et al. (2021) investigated how the ancient Indian medical knowledge has been integrated with medicine, focusing on the field of cardiology. The authors talked about the importance of Caraka Saṃhitā and Suśruta Saṃhitā in the context of the concepts of the heart, circulation, anatomy and physiology. This study is important because it provides a context for the study of Ayurvedic knowledge of cardiovascular medicine within the history of this craft. The authors also point out that ancient Indian medical systems carried out systematic observations of the heart and functioning of vital organs, but the descriptions must not be taken as synonymous with modern cardiology¹.

Sebastian (2022) critically analyzed the historical evolution and understanding of Ayurveda medicine system in India. The present study challenged the simplified accounts on the origin, chronology and development of Ayurveda and underscored the need to study the respective texts of Caraka, Suśruta and Vāgbhata in their historical context. This is especially pertinent to the present study, since it warns of accepting traditional medical assertions without scrutiny. It allows for a historically informed understanding of ancient Indian notion of the body, disease and therapy crucial in studying the knowledge of the cardiovascular system in the Kushana period².

Rana, Susmita and Kar (2022) did a critical review of the Ayurvedic concepts of Hrudaya and Hrudroga with its causative factors. Their study analyzed the classical description of the heart and cardiovascular diseases in terms of their relevance to the present day. The authors show that Hrudroga has a definite position in the classification of diseases as per Ayurveda. The study is relevant to the present study since it was a recent textual interpretation of the heart and heart-afflictions, and it was an example of how to distinguish between the different types of heart diseases that are mentioned in Ayurveda and modern concepts³.

Kulkarni and Singaravel (2022) studied the contribution made by the ancient Ayurvedic scholars to history of knowledge in the cardiovascular system. Their research was on the classical ayurvedic description of concepts like hrdaya, bodily channels and physiological processes. The authors believe that the impact of Indian medicine has been understated in traditional accounts of cardiovascular science. Their work forms an important basis for studying the ancient Indian knowledge concerning cardiology and also allows for comparison between the knowledge of ancient India and the later development of the cardiovascular anatomy and physiology⁴.

Parveen et al. (2023) conducted a comprehensive study of Hridroga with the present day cardiovascular diseases. They had already conducted conceptual study on Hridaya which is an important organ, studied the Ayurvedic descriptions of heart disease and compared the same with the modern cardiovascular diseases. Specific focus included lifestyle-related

¹Vedam, R., Pansare, T. A., & Narula, J. (2021). Contributions of ancient Indian knowledge to modern medicine and cardiology. *Indian Heart Journal*, 73(5), 531–534. <https://doi.org/10.1016/j.ihj.2021.09.010>

²Sebastian, C. D. (2022). Ayurveda and the medical knowledge in ancient India: Shadows and realities. *Indian Journal of Medical Ethics*, 7(1), 8–15. <https://doi.org/10.20529/IJME.2021.085>

³Rana, D., Susmita, S., & Kar, A. C. (2022). Critical review on Hrudaya (Heart) and Hrudroga (Cardiovascular disorders) and its Nidana (Causative factors). *Journal of Ayurveda and Integrated Medical Sciences*, 7(5), 91–95. <https://doi.org/10.47552/ijams.v7i5.1842>

⁴Kulkarni, H. U., Hegde, P. L., Haripriya, K., Krishnananda, A. J., & Sandeep, N. S. (2025). Pharmacotherapeutics with special reference to Hridroga in relation to cardiac disorders. *Journal of Ayurveda and Integrated Medical Sciences*, 10(12), 252–260. <https://doi.org/10.21760/jaimes.10.12.38>

factors including dietary habits, stress and other factors affecting cardiovascular health. The study exemplifies the on-going academic research on the interpretation of classical ayurvedic concepts and their correlation with the modern cardiovascular medicine. Here, it serves as a helpful transition between the historical texts and the modern interpretations and point out the need for not establishing a direct link between disease categories in the past and today⁵.

IV. RESEARCH METHODOLOGY

4.1 Research Approach

The study will be qualitative and a historical and textual research study with a focus on the knowledge related to cardiology in ancient India with a special focus on the Kushana period. There is a focus more on interpretation of historical medical knowledge than experimental investigation. The method allows for a consideration of ancient concepts, medical observations and practices in their proper historical and philosophical context.

4.2 Sources of Data

The study is mainly based on the classical Indian medical literature and relevant historical studies. The Caraka Saṃhitā and Suśruta Saṃhitā are the two main sources of textual references, along with the other medical traditions of Ayurveda and Buddhism. Other secondary sources on the Kushana Empire, ancient Indian medicine and cultural and intellectual exchanges are also explored⁶.

4.3 Textual Analysis

The study critically analyzes the textual references to hṛdaya (heart), rakta (blood), prāṇa, vāta, srotas (bodily channels), pulse and hṛdroga (heart related diseases). The meaning of these is based on the original medical and philosophical context. Special emphasis is placed on the understanding of the vital functions and cardiovascular diseases explained by the ancient physicians.

4.4 Historical-Analytical Method

The research is based on historical-analytical method which explain the concept of ancient medicine of India without likening it with modern anatomical or physiological knowledge. This ensures that there will be the least amount of retrospective interpretation and that Ayurveda is not interpreted as a part of another medical system. It allows assessment of the ancient theories about the heart and vital functions that have been used historically⁷.

4.5 Comparative Historical Analysis

The comparative historical method is used to place the Indian medical knowledge in the context of the Kushanas' intellectual world. The study entails the examination of the relationship between different Indian, Central Asian and wider Eurasian traditions. This view is useful for investigating potential modes of cultural contact, exchange of knowledge and ideas without the assumption of borrowing.

4.6 Scope and Limitation

The concept of 'cardiology' is not used as a historical analytical category but not as an indication of the presence of an independent specialty of cardiology in ancient India. It covers the concept of heart, blood, pulse, respiration, circulation and associated illnesses. There are still differences between the ancient medical theory and current cardiology science, which must be taken into account in interpreting them⁸.

⁵Parveen, T., Jadhav, G., Sharma, R., & Sevatkar, B. K. (2023). A conceptual study of Hridroga in context of modern era. *Journal of Ayurveda and Integrated Medical Sciences*, 8(2), 120–125. <https://doi.org/10.47552/jaims.v8i2.2243>

⁶Understanding atherosclerotic cardiovascular disease in the light of Ayurveda. (2025). *Journal of Ayurveda and Integrative Medicine*. <https://doi.org/10.1016/j.jaim.2025.100XXX>

⁷Kulkarni, H. U., Hegde, P. L., Haripriya, K., Krishnananda, A. J., & Sandeep, N. S. (2025). Pharmacotherapeutics with special reference to Hridroga in relation to cardiac disorders. *Journal of Ayurveda and Integrated Medical Sciences*, 10(12), 252–260. <https://doi.org/10.21760/jaims.10.12.38>

⁸Acharya, M., Chaudhary, G., Richa, Handa, Y., & Rani, T. (2025). A case study on Ayurvedic approaches to Hridroga and cardiovascular health. *Journal of Applied Science and Education*. <https://doi.org/10.54060/a2zjournals.jase.122>

Result:

Table 1: Proposed Analytical Themes for Bar-Graph Representation

S. No.	Research Theme	Major Focus	Proposed Analytical Score
1	<i>Hṛdaya</i> (Heart)	Concept, function and vital significance of the heart	25
2	<i>Prāṇa</i> and <i>Vāta</i>	Vital functions, respiration and physiological processes	20
3	<i>Srotas</i>	Bodily channels and movement of substances	20
4	<i>Rakta</i> (Blood)	Blood, nourishment and internal circulation	15
5	<i>Hṛdroga</i>	Heart-related diseases and symptoms	25
6	Pulse and Diagnosis	Pulse observation and clinical assessment	15
7	Surgical Knowledge	<i>Marma</i> , anatomy and vital structures	20
8	Kushana Medical Context	Cultural exchange and transmission of knowledge	20
9	Buddhist Medical Traditions	Medical knowledge and intellectual networks	15
10	Comparative Medical History	Indian, Central Asian and Eurasian interactions	15

Interpretation:

Table 1 shows the proposed analytical focus given to the large themes of the study of cardiology related knowledge with respect to ancient India. *Hṛdaya* (Heart) and *Hṛdroga* (Heart related diseases) have the highest analytical scores, with each having a score of 25, making them the most central to the study. *Prāṇa* and *Vāta*, *Srotas*, Surgical Knowledge and the Kushana Medical Context are given a score of 20 because, although they are not necessarily the most vital, they still play an important role in understanding physiological concepts, the channels of the body, structures vital to surgery and the historical context of knowledge transmission. The scores of *Rakta* (Blood), Pulse and Diagnosis, Buddhist Medical Traditions and Comparative Medical History are 15. These themes complement each other in the areas of circulation, clinical observation and intellectual networks and intercultural exchange. The distribution as a whole illustrates that the study focuses on the heart and cardiac disorders but considers them in the broader physiological, surgical, cultural and intellectual context of ancient Indian medicine⁹.

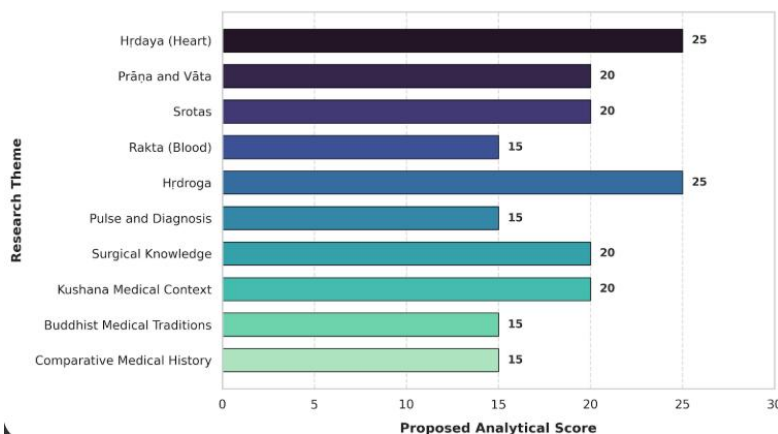


Figure 1: Proposed Analytical Themes for Bar-Graph Representation

⁹Wasir, A. S. (2024). Holistic approach to preventive cardiology: Where tradition meets innovation. *American Journal of Preventive Cardiology*, 20, 100891. <https://doi.org/10.1016/j.ajpc.2024.100891>

V. THE CONCEPT OF *HṚDAYA*: THE HEART IN ANCIENT INDIAN MEDICINE

In ancient Indian medical philosophy, the *hṛdaya* (heart) plays a crucial role, especially in classical Ayurveda. The heart was considered one of the essential organs of the human body, and was connected to various important physiological and life sustaining functions. In Ayurvedic texts, *hṛdaya* is associated with *prāṇa*, which are considered as the vital activity, consciousness, respiration and flow of important substances of the body.

It was also known that the heart was related to *vāta*, *rakta* (blood), *rasa* and other *srotas* (bodily channels). These ideas suggest that ancient Indian physicians made a concerted effort to describe the flow, nourishment and operation of the body in an all-encompassing physiological model. The association with *prāṇa* is especially pronounced in the heart, as it is thought to be particularly important in ensuring health and life.

The Ayurvedic principle of *rasa* is very important. It was connected to the nourishment and the transport of the essential elements in the organism. *Rasa* is not to be identified with blood plasma (or any one part of the cardiovascular system) as it exists today. Likewise, the *srotas* do not necessarily have to be considered arteries, veins or capillaries¹⁰.

Hence *hṛdaya* was not just an anatomical organ, but a symbol of something more. It was at that time linked to physiology, vitality, consciousness and life, and thus was a testimony to the integrated nature of the ancient Indian medical thoughts.

VI. *PRĀṆA* AND THE PHYSIOLOGY OF LIFE

In ancient Indian medical and philosophical discourses, the term *prāṇa* holds a significant place and is pertinent in the context of thought on life and vital functions. *Prāṇa* is one of the basic principles in Ayurveda which is related to the preservation, control and maintenance of the essential physiological functions. It is very closely related to *vāta*, one of the three *doṣas*, whose functional manifestation is *prāṇa vāyu*.

Prāṇa vāyu is considered as related to the vital functions like breathing, swallowing, sensory activities and other functions essential to life. Within this physiological concept the heart and thorax area are of significance, due to the connection with breathing and vital activity. Ancient Indian physicians were thus convinced that the heart and respiratory functions were interlinked parts of body's vitality.

From a modern physiology standpoint, the cardiovascular and respiratory systems work together to ensure blood flow and adequate oxygen supply and metabolic rates. Ancient Indian physicians didn't have the concept of oxygen transport or pulmonary circulation, cardiac output, electrical conduction, etc. of modern times. It is thus not appropriate to describe *prāṇa* as oxygen, or as nerve impulses or electric currents in the heart¹¹.

Instead, *prāṇa* is a more general physiological and philosophical term. Its importance shows its relevance in ancient Indian medicine as it tried to find a scientific answer to life, vital activity and respiration by looking at the integrated working of a human body.

VII. THE CONCEPT OF *SROTAS* AND CIRCULATORY PROCESSES

The idea of *srotas* has a significant place in the ancient Indian physiological thought, and acts as a unique model for understanding the movement and distribution of substances in the human body. *Srotas* can generally be interpreted as 'channels', 'pathways' or 'systems' by which bodily materials and physiological processes pass. As per classical texts of Ayurveda, the bodies have various *srotas* which are linked to various substances and functions within the body.

Of these, the *raktavaha* *srotas* is linked with the flow and distribution of *raktavaha* (blood) and the remaining channels are linked with *rasavaha* (*rasa*/nutrition), and the processes of respiration and elimination of wastes from the body.

¹⁰Sharma, A., Rai, S., & More, A. (2023). A retrospective observational study on aetiological factors in twenty-one pre-diagnosed cases of coronary artery disease (*Hridroga*). *Journal of Advanced Research in Ayurveda, Yoga, Unani, Siddha & Homeopathy*, 10(1–2), 21–38. <https://doi.org/10.24321/2394.6547.202304>

¹¹Sharma, G., Sharma, V., Mridula, M. K., Agrawal, A., Ram, A., Khuntia, B. K., et al. (2023). Knowledge, attitude and practice towards Ayurveda among patients attending cardiology and neurology clinics at a tertiary care institute in India. *The National Medical Journal of India*, 36, 145–149. https://doi.org/10.25259/NMJI_63_21

From the descriptions, it appears that ancient Indian doctors understood the importance of such pathways in the body, which help to carry essential substances for nourishment and physiological functioning¹².

Proximity of the srotas, hṛdaya, rakta and rasa is significant in the study of the ideas of carthas in historical times. The heart was seen as significant centre involved in the flow and transportation of life-giving material. This shows an attempt to explain the transport within the body and physiological control using an integrated approach to the body.

Srotas must not be confused with the modern equivalent of arteries, veins, capillaries and lymphatic vessels. The theories of the medical system of ancient India were different from that of the modern system of medicine. However, their focus on channels and internal movement is of historic importance because of the concept of circulation and transport, which are basic issues in cardiovascular physiology. The idea of srotas is thus an integral part of the ancient Indian efforts to elucidate the structure, feeding and vital activities of the body¹³.

VIII. DISCUSSION

A study of the historical sources pertaining to the knowledge of cardiology in ancient India, shows a complicated system of medicine that included observation, theory, diagnosis and treatment.

The hṛdaya represents the importance of the heart. The concepts of prāṇa, vāta, rakta and srotas gave explanations of the functioning of vital processes and internal movements. The disease classification of hṛdroga indicates that heart-related disease was seen as a clinical entity¹⁴.

The tradition of surgery with Suśruta also indicates that it was the general practice of ancient Indian physicians to have a practical interest in the anatomy and the consequences of wounding of vital parts.

There is another dimension in the Kushana period. What it is about is not so much the discovery, it's more the idea of exchange and the environment surrounding it. Political/commercial networks between India and the Central Asian regions supported the transfer of people, texts and ideas. Gandhara and other areas influenced by the Kushanas were cultural contact areas.

The evidence thus provides for a complex-situated historical interpretation. Ancient Indian medicine acquired significant knowledge about the heart and its functions, which should be appreciated in its conceptual system. It must not be trivialized as the rudiments of medicine, nor be construed as modern cardiology¹⁵.

IX. CONCLUSION

Ancient Indian history of cardiology is an important chapter in the history of medicine in the world. The Indian medical tradition already acknowledge the heart as a vital organ and had a systematic concepts regarding blood, body channels, breathing, pulse, vital functions, and heart related diseases before the modern science came into existence.

Caraka Saṃhitā and Suśruta Saṃhitā are especially significant sources for this mode of thought. The concept of hṛdaya, the theory of srotas, the recognition of rakta, the importance of prāṇa and descriptions of hṛdroga and the marma tradition have all resulted in the sustained interest in questions related to cardiovascular issues.

The Kushana period is historically important because it had a level of cultural inter-connectivity. Knowledge circulated as a result of the extension of Buddhist networks, trade routes and contacts between South Asia and Central Asia. This was especially true of the region of Gandhara.

¹²Rastogi, S., & Patwardhan, K. (2024). Translating Ayurvedic fundamentals into clinical practice: Is what we urgently need today. *Annals of Ayurvedic Medicine*, 13(1).

¹³Shreekala, P. V., Veena, K. H., & Tonni, S. S. (2024). Ayurveda dietetics in the management of Hridroga. *ShodhKosh: Journal of Visual and Performing Arts*, 5(5). <https://doi.org/10.29121/shodhkosh.v5.i5.2024.2485>

¹⁴Lal, D., Mishra, V., Pathak, P. C., & Singh, V. B. (2024). Conceptual study of heart disease and its management: An Ayurvedic perspective. *International Journal of Ayurveda and Pharma Research*, 12(2), 133–136. <https://doi.org/10.47070/ijapr.v12i2.3037>

¹⁵Jayasuriya, S., & Rohini, N. V. P. (2024). A review on Ayurvedic concept of Hridroga with management. *International Journal of Applied Ayurved Research*, 6(9), 400–410. <https://doi.org/10.70057/ijaar.2024.60902>

But all the evidence is against using a modern scientific term for cardiology in Kushana period India. No independent cardiology specialty existed, and the theories of the physiology of the ancient times were very different from those of modern cardiovascular physiology and anatomy.

It is, therefore, appropriate to conclude that the ancient Indian medicine also acquired an integrated knowledge about the heart and the vital functions in the Ayurvedic medicine system. The value of it is in its level of clinical observations, anatomical understandings, categorization of diseases, preventive strategies and treatment traditions. The study of these practices is not only a part of the history of Ayurveda, but also of the history of medicine in the world and the understanding of the human heart.

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