

The Concept and Functional Classification of A‘dā’ Ra’īsa (Vital Organs) in Unani Medicine: A Comprehensive Review

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Abstract

Review Article

Background: In classical Unani medicine, A‘dā’ Ra’īsa (vital organs) represent the chief compound organs (Aaza-e-Murakkaba) essential for sustaining human existence and maintaining physiological equilibrium. Early Unani physicians established a comprehensive anatomical and philosophical framework surrounding these organs, defining their central roles in individual survival and species continuity. **Objectives:** This review aims to systematically compile, categorize, and synthesize classical Unani concepts, anatomical descriptions, and functional classifications regarding A‘dā’ Ra’īsa, while examining their integration with vital faculties (Quwā) and pneuma (Arwāh). **Methods:** A qualitative compilation and thematic analysis was conducted using classical Unani medical literature including Firdaws al-Ḥikmat by Rabban Ṭabarī, Kitāb al-Manṣūrī by Abū Bakr al-Rāzī, Kāmil al-Ṣanā‘a al-Ṭibbiyya by Ali Ibn Abbas Majūsī, Al-Qānūn fī al-ṭibb by Ibn Sīnā, and Kitāb al-Kulīyyāt by Ibn Rushd cross-referencing classical anatomical terminology (Iṣṭilāḥāt) with functional organ systems. **Results:** Classical literature categorizes A‘dā’ Ra’īsa into two primary teleological divisions: (1) Preservation of the Individual (Baqa-e-Shakhs), comprising the Brain (Dimāgh); governing psychic faculties Quwwat Nafsāniyya, Heart (Qalb; governing vital heat Ḥarārat Gharīziyya and pneuma Rūḥ Haywāniyya), and Liver (Kābid; governing metabolic physical faculties Quwwat Ṭabī‘iyya and humor formation Akhlāt); and (2) Preservation of the Species (Baqa-e-Nau), comprising the Gonads (Khusyatayn wa Khusya al-Raḥim; housing the generative faculty Quwwat Muwallida for gamete formation Nutfa Saazi). Unani physicians also classified these organs based on pneuma dynamics into Mubda-e-Fayli (generators of pneuma) and Mubda-e-Qabli (recipients of pneuma). **Conclusion:** The Unani doctrine of A‘dā’ Ra’īsa presents an integrated physiological model where organ structure, vital heat, and pneumatic forces function in harmony. Modern anatomical and physiological understandings of the nervous, cardiovascular, hepatobiliary, and reproductive systems strongly align with the systemic insights established by classical Greco-Arabic physicians.

Keywords: A‘dā’ Ra’īsa; Vital Organs; Unani Medicine; Baqa-e-Shakhs; Baqa-e-Nau; Arwāh; Tashrīḥ-ul-Badan.

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1. INTRODUCTION

Anatomy (Tashrīḥ-ul-Badan) is one of the oldest fields of medicine, serving as the fundamental structural foundation of the Unani System of Medicine (USM) [1]. Knowledge of the human body has been acquired gradually over centuries through observational expertise and analytical reasoning [2]. Ibn Sīnā (Avicenna), one of the most illustrious scholars in Unani medicine, underscored the paramount importance of

detailed observation and structural analysis of organs to diagnose and treat clinical conditions effectively [3]. Classical Unani literature reflects a rich repository of anatomical knowledge accumulated by early pioneers, including Herophilus and Aristotle (Arastu), who laid the groundwork for systematic anatomical studies [4, 5].

A core philosophical underpinning highlighted by Galen (Jālīnūs) is that every organ in the human body is created with a specific purpose and is perfectly adapted

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to fulfill its designated physiological role [6]. Within this anatomical framework, A'dā' Ra'isa (vital or chief organs) occupy the central position in Unani medical thought [7]. Included among compound organs (Aaza-e-Murakkaba), A'dā' Ra'isa are indispensable for human survival, ensuring the viability of the body's primary systems across two functional divisions [7, 8]:

a. Preservation of the Individual (Baq-e-Shakhs):

Comprising three principal governing organs: the Heart (Qalb), Brain (Dimāgh), and Liver (Kabid). The Qalb is the central organ of circulation, circulating oxygenated blood (Rūh) through arteries (Sharāyīn). The Dimāgh serves as the control center of the nervous system, governing sensory (Quwwat-e-hiss) and motor (Quwwat-e-irādiyya) functions via nerves (A'sāb). The Kabid governs digestion and metabolism, processing nutrient extract from the gastrointestinal tract to manufacture essential humors (Akhlāt) [7, 8].

b. Preservation of the Species (Baq-e-Nau):

Encompassing the primary generative organs, specifically the Testes (Khusyatayn) and Ovaries (Khusya al-Rahim), essential for gamete production (Nutfā Saazi) and ensuring generational succession [7, 8].

Furthermore, Unani physicians classified A'dā' Ra'isa based on pneuma (Arwāh) dynamics, distinguishing between Mubda-e-Fayli (creators/generators of pneuma) and Mubda-e-Qabli (acceptors/recipients of pneuma) [9, 10]. Early scholars such as Rabban Tabarī in Firdaws al-Hikmat described the heart as the epicenter of vital heat (Ḥarārat Gharīziyya), strategically positioned centrally in the chest to ensure uniform thermal and blood distribution [10]. While classical Unani texts contain rich anatomical descriptions, these insights remain scattered across historical manuscripts. Systematically compiling and evaluating these foundational concepts serves to document the intellectual heritage of Greco-Arabic physicians while establishing conceptual bridges with modern medical anatomy.

2. Objectives:

This review aims to

- elucidate the concept of A'dā' Ra'isa (vital organs) in Unani Medicine.
- systematically classify the vital organs according to their functional roles in Unani Medicine

3. METHODOLOGY

This study employed a qualitative, exploratory, and comparative historical-analytical research design. The methodology combined systematic archival compilation of classical Greco-Arabic medical manuscripts with comparative analysis against modern medical literature.

Primary textual sources and reference works were gathered through structured archival research across major medical libraries and manuscript repositories, including State Takmeel-ut-Tib College and Hospital (Lucknow), King George's Medical University (Lucknow), Central Library of Hamdard University (Delhi), Maulana Azad Library at Aligarh Muslim University (Aligarh), Raza Library (Rampur), and Khuda Bakhsh Oriental Public Library (Patna).

The historical review evaluated authoritative anatomical literature across three primary eras:

i. Greek Anatomical Foundations:

Observational insights from Alcmaeon, Hippocratic Corpus treatises (On Injuries of the Head, On the Places in Man, On the Sacred Disease, On the Heart) [11, 12], Aristotle's biological treatises (Historia Animalium, De Partibus Animalium) [13, 14, 15], Alexandrian anatomical findings of Herophilus and Erasistratus [16, 17, 18], and Galen's anatomical and physiological works [19, 20, 21].

ii. Islamic Golden Age & Medieval Unani Classics:

Firdaws al-Hikmat fi'l Tibb by Rabban Tabarī [10], Kitāb al-Manṣūrī and Kitāb al-Hāwī fi'l Tibb by Abū Bakr al-Rāzī (Rhazes) [22, 23], Kāmil al-Ṣanā'a al-Ṭibbiyya (Kitāb al-Malikī) by Ali Ibn Abbas Majūsī [24], Kitāb al-Mi'a fi'l Tibb and Tashriḥ Badan al-Ensan by Abū Sahl Masīhī [25, 26], Al-Qānūn fi al-tibb and Fi Ahval-e al-Qalb by Ibn Sīnā (Avicenna) [27, 28, 29], Dhakhīra Khwarizm Shāhī by Ismā'il Jurjānī [30], Kitāb al-Kulliyāt by Ibn Rushd (Averroes) [9, 31], Kitāb al-Mukhtārāt fi'l Tibb by Ibn Hubal Baghdadi [32], and Kitāb al-'Umda fi'l Jarāḥat by Ibn al-Quff Masīhī [33].

iii. Modern Unani Standard Texts:

Standardized commentaries and compilations, including Hakeem Mohammad Kabiruddin's Kulliyāt-e-Qanoon, Kulliyāt-e-Nafeesi, and Tashreeh Sageer [7, 8, 34].

Classical Arabic and Persian anatomical terminologies (Istīlāḥāt) were cataloged and mapped directly to modern Latin and English medical nomenclature (e.g., Umm-i-Ghalīz to Dura Mater, Bāb al-Kabid to Porta Hepatis, Awriṭā to Aorta, Ajwaf to Vena Cava) [35].

4. Anatomical Findings

4.1 Dimāgh (Brain)

Classical Unani anatomists defined the brain as an organ of cold and moist (Bārid-Rātib) temperament, situated within the cranial cavity and divided vertically into two symmetrical hemispheres by a longitudinal falx membrane [10, 12, 28].

4.1.1 Meningeal Coverings (Umm-ul-Dimāgh):

The brain is enveloped by two primary protective layers: Umm-i-Ghalīz (Dura Mater), a thick, tough, fibrous outer membrane attached to the cranium

that sends inner structural folds including Tayyi-e-muqaddam (falx cerebri), Khaimta-e-almikh (tentorium cerebelli), and Tayyi-e-muakhar (falx cerebelli) [28, 29]; and Umm-i-Raqīq (Pia Mater), a delicate, highly vascularized inner membrane adhering directly to brain tissue and carrying nutrient capillaries into the parenchyma [10, 26, 28]. Herophilus and Avicenna also identified the middle web-like arachnoid layer (Ghisha-e-Ankabutia) [16, 28].

4.1.2 Ventricular System (Butūn-e-Dimāgh):

Unani physicians mapped an interconnected system of internal cavities (Butūn) containing psychic pneuma (Rūh Nafsāniyya) and fluid [18, 24, 28]. Paired Anterior Ventricles (Batan Muqaddam) govern imagination (Takhayyal) and extend olfactory bulb projections (Halimat-e-sadin) toward the ethmoid bone (Al-'Azm al-Misfāt) [24, 23, 36]. The Middle Ventricle (Batan Ausat) governs cognition, thinking (Fikr), and common sense [24, 37]. The Posterior Ventricle (Batan Moakhhar) is firmer in consistency, serving as the seat of memory (Hāfiza) and giving origin to motor nerves and the spinal cord (Nukhā') [10, 24, 28].

4.1.3 Specific Neuroanatomical Landmarks:

Ibn Sīnā discovered and named the cerebellar vermis as Doodah-e-MeeKh (vermis) and the caudate nucleus as Janbi-e-nabat (nucleus caudatus) [28, 38]. Scholars including Galen, Majūsī, Masīhī, and Avicenna detailed the pineal gland (Habb-e-Sanobrya), corpus callosum, fornix, infundibulum, and the venous confluence Torcular Herophili (Masherah) [16, 39, 24, 26].

4.2 Qalb (Heart)

Unani scholars characterized the heart as a firm, conical or pine-fruit-shaped (Sanobari) muscular organ positioned centrally in the thoracic chest, with its broad base facing upward and its apex inclined toward the left intercostal space [9, 24, 23].

4.2.1 Pericardial Enclosure (Ghilāf-i-Qalb):

The heart is enclosed within a dense protective fibroserous sac (Ghilāf-i-Qalb / Niam) containing serous fluid (Ruṭūba-i-Ghilāf-i-Qalb) that lubricates continuous pulsation and absorbs friction heat [28, 40, 41, 42].

4.2.2 Cardiac Chambers & Wall Structure:

Unani anatomists divided the cardiac cavity into ventricles, noting universally that the left ventricular wall is significantly thicker and more muscular than the right ventricle wall, enabling high-pressure systemic pumping [40, 43, 44, 45].

4.2.3 Atrial Reservoirs (Udhun al-Qalb / Uznain):

Near the cardiac base are soft, ear-like nervous protrusions known as Udhun al-Qalb or Uznain (atria/auricles) that serve as receiving reservoirs for incoming blood and air [24, 23, 46, 32].

4.2.4 Valvular Mechanics:

Classical texts detailed unidirectional valves, including the three-cusped tricuspid valve (Simam Salasaturrus) at the right inlet, three-leafed semilunar valves (Simam Hilaliyya) at arterial outlets (Aorta Awritā and Pulmonary Artery Warid Shiryani), and the two-leafed mitral valve at the pulmonary vein outlet [24, 23, 43, 47, 48].

4.2.5 Vascular Architecture & Capillaries:

The aorta (Awritā) emerges from the upper left ventricle. Rhazes and Avicenna described the coronary arteries encircling the cardiac base [22]. Crucially, Avicenna, Majūsī, and Ibn al-Quff conceptualized a peripheral network of microscopic, hair-like fenestrations and invisible anastomoses connecting arteries and veins, anticipating capillary microcirculation [49, 50, 51].

4.3 Kabid (Liver)

The liver (Kabid) was recognized as the chief metabolic organ of the physical faculty (Quwwat Ṭabī'iyya), situated in the right hypochondriac region beneath the diaphragm (Hijaab-i-Hājiz) [10, 24, 32].

4.3.1 Gross Morphology:

Crescentic (Hilali) in shape, its smooth convex superior surface fits against the diaphragm, while its concave visceral surface cradles the stomach and intestines [24, 23].

4.3.2 Hepatic Lobes:

The parenchyma is divided into two to five lobes (Fusus al-Kabid), with the smallest appendage designated as Zaida-e-kabid (caudate lobe) situated near the stomach [24, 23].

4.3.3 Portal System & Hepatic Hilum:

At the concave visceral hilum termed Bāb al-Kabid (porta hepatis), the portal vein (Warid al-Bab / Bawaab) enters after collecting nutrient-laden chyle (Kaylūs) from mesenteric vessels (Jadd-i-Awwal) [24, 23, 52].

4.3.4 Humoral Concoction (Pepsis):

Within intrahepatic vascular capillary networks, digested chyle undergoes concoction (Pepsis) via the altering faculty (Quwwat Mughayyira), manufacturing the four primary humors (Akhilāt): blood (Dam), phlegm (Balgham), yellow bile (Safrā'), and black bile (Saudā') [24, 28, 53]. Refined venous blood then collects at the convex surface and exits into the Ajwaf (inferior vena cava) [24, 52].

4.4 Khuṣyatayn wa Khusya al-Rahim (Testes and Ovaries)

Unani physicians evaluated the primary generative organs responsible for species preservation (Baqā-e-Nau) and gamete formation (Nutfā Saazi) [7, 8].

4.4.1 Male Testes (Khusyatayn):

Soft, spongy, white glandular compound organs housed within a multi-layered scrotal sac (Safan) [24, 23]. Supplied by spermatic arteries descending from the aorta in a convoluted, spiral trajectory, this prolonged transit path allows blood to metabolize, cool, and transform into seminal fluid and mature sperm (Nutfa) within convoluted seminiferous structures [24, 23]. Sperm travels through the epididymis and seminal vesicles (Aw'iya Manī) to the penis (Qaḍīb) and urethra (Ihlīl) [24, 23].

4.4.2 Female Ovaries (Khusya al-Raḥim):

Masīhī and Avicenna explicitly identified female ovaries (Khusya al-Raḥim) as internal anatomical equivalents to male testes [26, 28]. Located internally on either side of the uterus (Raḥim), enclosed in private membranous sacs, ovaries actively participate in gamete formation (Nutfa Saazi) and zygote formation [26, 28, 30].

5. Comparative Discussion with Modern Anatomy

The comparative evaluation between classical Unani anatomical concepts (Tashrīḥ-ul-Badan) and modern medical science demonstrates remarkable empirical alignment, as detailed in Table 1 below.

Table 1: Comparative mapping between classical Unani anatomical concepts and modern medical science.

Unani Anatomical Concept	Classical Description (Iṣṭilāḥāt)	Modern Anatomical & Physiological Equivalent
Brain Meninges	Umm-i-Ghaliz & Umm-i-Raqiq	Dura mater and Leptomeninges (Pia mater & Arachnoid mater) [12, 28]
Ventricular System	Butūn-e-Dimagh (Batan Muqaddam, Ausat, Moakhhar)	Lateral, 3rd, and 4th Ventricles & Cerebral Aqueduct [18, 24, 37]
Specific Neural Landmarks	Doodah-e-MeeKh & Janbi-e-Nabat	Cerebellar Vermis & Caudate Nucleus [28, 38]
Pericardium & Fluid	Ghilāf-i-Qalb & Ruṭūba-i-Ghilāf-i-Qalb	Fibrous Pericardial Sac & Pericardial Serous Fluid [28, 40, 42]
Ventricular Myocardium	Thicker muscular left ventricle wall	Left ventricular hypertrophy for high-pressure systemic pumping [40, 55]
Atrial Reservoirs	Udhun al-Qalb / Uznain	Right & Left Atria receiving venous blood return [24, 23, 56]
Capillary Precursors	Invisible hair-like fenestrations/anastomoses	Capillary beds connecting arterial and venous networks [49, 50, 51]
Hepatic Hilum & Portal Vein	Bāb al-Kabid & Warid al-Bab / Bawaab	Porta Hepatis & Portal Vein System [24, 23, 52]
Metabolic Concoction	Chyle conversion to humors in Kabid	Hepatic portal filtration, glycogen synthesis, & metabolism [24, 53]
Testicular Micro-architecture	Tortuous vessels & Aw'iya Manī	Pampiniform plexus, Seminiferous tubules, & Vas deferens [24, 23]

Classical Unani anatomical findings demonstrate remarkable structural alignment with modern medical science. In neuroanatomy, the classical functional division between the soft anterior brain (governing sensory reception) and the harder posterior brain/spinal cord (governing motor output) directly prefigures modern sensory cortex and motor pathway localization [28, 54]. Avicenna's explicit identification of the cerebellar vermis (Doodah-e-MeeKh) and caudate nucleus (Janbi-e-nabat) remains part of modern neuroanatomical terminology [38].

In cardiology, Unani descriptions of cardiac apex orientation, pericardial fluid function in reducing friction, and the unidirectional operation of AV and semilunar valves reflect accurate physical observations [40, 47, 42]. Crucially, theoretical models of minute peripheral pores and anastomoses proposed by Avicenna, Majūsī, and Ibn al-Quff anticipated the discovery of capillary microcirculation centuries before microscopic verification [50, 51].

In hepatology and reproductive biology, mapping the porta hepatis (Bāb al-Kabid), portal vein filtration, scrotal thermoregulation/tortuous pampiniform pathways, and ovarian-testicular homology highlights the empirical depth of Greco-Arabic anatomical research [24, 26, 23, 52].

6. CONCLUSION

The anatomical contributions of Unani physicians regarding the vital organs namely the brain (Dimāgh), heart (Qalb), liver (Kabid), and testes (Khusyatayn) represent a monumental achievement in medical history. Scholars such as Ibn Sīnā (Avicenna), Ali Ibn Abbas Majūsī, Abū Bakr al-Rāzī (Rhazes), Ibn Rushd (Averroes), and Rabban Ṭabarī systematically investigated the structural, functional, and inter-systemic relationships of these chief organs [10, 24, 28, 31, 23]. Their works preserved and expanded upon Greco-Roman anatomical texts while adding empirical observations that served as precursors to modern anatomical science.

Ultimately, Unani anatomy presents an integrated, holistic framework where structural organization, vital forces (Quwā), and pneuma (Arwāh) operate in system-wide harmony to preserve both individual life (Baqa-e-Shakhs) and species survival (Baqa-e-Nau) [7, 8]. Modern anatomical and physiological sciences strongly validate these foundational historical descriptions, affirming the enduring intellectual legacy of Unani physicians in the evolution of anatomical science.

Conflict of Interest

The authors declare that there are no conflicts of interest to disclose in relation to the publication of this manuscript.

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Ethical Considerations

As this is a historical-literature-based study, no human or animal subjects were involved, and thus no ethical clearance was required. However, due academic integrity was maintained through proper citation and referencing practices.

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