

**IMPORTANCE OF GHRITA (CLARIFIED BUTTER) IN PANDU ROGA (ANEMIA): AN
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ABSTRACT

Background & Objectives: Pandu Roga is a well-described systemic disorder in Ayurvedic classics, characterized by Panduta (pallor), Daurbalya (weakness), Bhrama (giddiness), Hridspandana (palpitations), Aruchi (anorexia), and Shrama (fatigue). Its clinical presentation closely resembles anemia, particularly Iron Deficiency Anemia (IDA). Ghrita (clarified butter/ghee) occupies a unique place in Ayurvedic therapeutics owing to its Rasayana, Agnivardhaka, Medhya, Balya, Yogavahi, and Vata-Pitta Shamaka properties. Classical texts repeatedly advocate Ghrita in Pandu Roga both as Ahara (diet) and Aushadha (medicine). **Methods:** Classical references from Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Kashyapa Samhita, Bhaishajya Ratnavali, Chakradatta, Sahasrayoga, and Yogaratnakara were critically reviewed. Modern literature on anemia, iron metabolism, nutritional science, gut health, lipid-mediated nutrient absorption, and published research on Ghrita and Pandu/IDA was analyzed. **Results:** Ghrita demonstrates multidimensional therapeutic utility in Pandu Roga through Deepana-Pachana, Dhatu Poshana, Rasayana effect, Pitta Shamana, Vata Anulomana, bioavailability enhancement, and nourishment of Rasa-Rakta Dhatu. Modern evidence supports its role in maintaining gut health, enhancing absorption of fat-soluble vitamins, providing short-chain and medium-chain fatty acids, and indirectly assisting hematopoiesis through improved digestion and assimilation. **Conclusions:** Ghrita is not merely a dietary fat but a pharmacologically active therapeutic substance. Judicious use of Ghrita in Pandu Roga can improve Agni, support tissue nourishment, enhance delivery of hematinic formulations, and contribute significantly to the comprehensive management of anemia. Integrative research combining Ayurvedic principles with modern hematological and nutritional parameters is warranted.

KEYWORDS: Pandu Roga, Anemia, Ghrita, Ghee, Ayurveda, Iron Deficiency Anemia, Rasayana, Rakta Dhatu.**1. INTRODUCTION**

Anemia remains one of the most prevalent nutritional and hematological disorders worldwide. According to World Health Organization (WHO) estimates, anemia affects more than 1.62 billion people globally, with disproportionate impact on women of reproductive age, children, adolescents, and individuals from lower socioeconomic backgrounds.^[1] Iron deficiency remains the commonest cause, accounting for approximately 50% of all cases; however, deficiencies of folate, vitamin B12, chronic inflammation, parasitic infections, malabsorption syndromes, and chronic disease-associated mechanisms also contribute substantially.^[1,2]

In Ayurveda, Pandu Roga is a well-described clinical entity documented in Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Madhava Nidana, Bhaishajya Ratnavali, and other authoritative texts.^[3-6] The term 'Pandu' denotes a pale yellowish-white discoloration of the body, resembling dry leaves or pollen. Acharya Charaka considered Pandu among important systemic disorders caused predominantly by Pitta Dushti associated with Rakta and Mamsa Dhatu involvement.^[3]

The Ayurvedic understanding of Pandu extends beyond a simple reduction in hemoglobin. It encompasses impaired digestion (Mandagni), defective nourishment of

tissues, depletion of Ojas, mental fatigue, derangement of Rasa-Rakta Dhatu, and impaired metabolic transformation at the Dhatwagni level. This holistic perspective aligns with modern insights into the multifactorial pathophysiology of anemia.^[3,7]

Among the various therapeutic modalities advised for Pandu Roga, Ghrita (clarified butter/ghee) occupies a central role.^[3-6] Classical Ayurvedic texts prescribe Snehapana with Ghrita before Shodhana (purification), medicated Ghrita preparations, Ghrita as Anupana (vehicle) with Lauha preparations, and Ghrita as Rasayana (rejuvenative). The significance of Ghrita extends beyond nourishment: Ayurveda recognizes its Yogavahi (carrier/bioenhancer) property, Samskarasya Anuvartanam (ability to retain and enhance properties of processed drugs), Sukshma Marganusari (subtle penetrative) nature, and Tridosha-balancing action, especially Vata-Pitta Shamana.^[8]

This review critically analyzes the role of Ghrita in Pandu Roga through classical Ayurvedic, pharmacological, nutritional, and contemporary biomedical lenses, aiming to provide an integrative framework for its rational application in anemia management.

2. CONCEPT OF PANDU ROGA IN AYURVEDA

2.1 Etymology and Definition

The word 'Pandu' is derived from 'Pan' (to worship) or is used descriptively to denote a pale yellowish-white color. Charaka Samhita (Chikitsa Sthana, 16th chapter) describes Pandu Roga as a condition in which the skin, nails, eyes, and entire body acquire pallor due to the vitiation of Pitta and consequent depletion of Rakta Dhatu.^[3] Charaka enumerates five types of Pandu Roga: Vataja, Pittaja, Kaphaja, Tridoshaja, and Mridbhakshana Janya Pandu.^[3]

2.2 Nidana (Etiological Factors)

Classical texts enumerate diverse causative factors grouped as follows.

- Dietary: Excess Amla (sour), Lavana (salt), Kshara (alkaline), and Ushna (hot) foods; Viruddha Ahara

(incompatible diet); frequent fasting; excess alcohol; nutritionally deficient or stale foods.^[3,4]

- Lifestyle: Excessive physical exertion, day sleep, night awakening, psychological stress, and excessive sexual activity.^[3,5]

- Pathological: Krimi (worm infestation), chronic blood loss, malabsorption, Grahani disorders, and chronic systemic illness.^[3,6]

These causative factors ultimately produce Agnimandya (impaired digestive fire), Rasa Dhatu Dushti (vitiation of the nutrient fraction), impaired Rakta formation, Dhatu Kshaya (tissue depletion), and Ojakshaya (depletion of vital essence).^[3]

2.3 Samprapti (Pathogenesis)

According to Charaka Samhita, aggravated Pitta located in the Hridaya spreads through the Dasha Dhamanis and vitiates Kapha, Vata, Twak (skin), Rakta, and Mamsa Dhatu, resulting in Panduta.^[3] Agnimandya occupies a crucial position in this pathogenesis. Defective digestion leads to improper Rasa Dhatu formation, which subsequently impairs Rakta Dhatu. Thus, Pandu represents a systemic nutritional-metabolic disorder with digestive dysfunction at its core.^[3,7]

2.4 Clinical Features

The major clinical features described in Ayurvedic classics include.

- Panduta – Pallor of skin, eyes, nails, and mucosae
- Daurbalya – Generalized weakness and debility
- Bhrama – Giddiness and vertigo
- Shrama – Fatigue on exertion
- Aruchi – Anorexia and loss of appetite
- Hridspandana – Palpitations
- Swasa – Dyspnoea / breathlessness
- Shotha – Oedema, especially pedal
- Akshikuta Shotha – Periorbital puffiness
- Pindikodweshtana – Calf muscle cramps

3. CORRELATION BETWEEN PANDU ROGA AND ANEMIA

Although Pandu Roga cannot be entirely equated with iron deficiency anemia (IDA), strong clinical and pathological parallels exist between the two. Table 1 summarizes these correlations.

Table 1: Correlation between Pandu Roga features and modern anemia parameters.

Ayurvedic Feature	Modern Correlation
Panduta	Pallor (reduced hemoglobin/tissue oxygenation)
Daurbalya	Weakness (reduced oxygen delivery to muscles)
Bhrama	Dizziness (cerebral hypoxia)
Hridspandana	Palpitations (compensatory tachycardia)
Shrama	Fatigue (cellular energy deficit)
Agnimandya	Malabsorption / impaired digestion
Rasa-Rakta Kshaya	Reduced hematopoiesis / low plasma protein
Ojakshaya	Reduced vitality and immunocompetence

Several Ayurvedic scholars have proposed specific correlations: Vataja Pandu with iron deficiency anemia, Pittaja Pandu with hemolytic conditions, Kaphaja Pandu

with megaloblastic/folate-B12 deficiency anemia, and Mridbhakshana Janya Pandu with nutritional anemia associated with pica.^[7,9] Modern medicine also

recognizes that impaired absorption, chronic inflammation, poor nutrition, and intestinal dysfunction play pivotal roles in anemia — concepts Ayurveda encoded as Agni impairment and Dhatu Poshan defects centuries ago.^[2,3]

4. GHRITA IN AYURVEDA: PROPERTIES AND PHARMACODYNAMICS

4.1 Definition and Classical Status

Ghrita is considered the most superior among the four principal Sneha Dravyas (oleaginous substances) —

Ghrita, Taila, Vasa, and Majja — described in Ayurveda.^[8] Cow ghee (Gau Ghrita) occupies the highest position. Acharya Charaka eulogizes: 'Ghritam Smritibuddhyagni Shukra Ojas Kapha Meda Vardhanam' — highlighting its ability to enhance memory, intelligence, digestive fire, reproductive vitality, and Ojas.^[3]

4.2 Dravyaguna (Pharmacological Properties)

The classical pharmacological profile of Ghrita is as follows.

Table 2: Classical Dravyaguna properties of Ghrita.

Property	Value
Rasa (Taste)	Madhura (Sweet)
Guna (Qualities)	Snigdha (unctuous), Guru (heavy), Mridu (soft)
Virya (Potency)	Sheeta (cold)
Vipaka (Post-digestive)	Madhura (Sweet)
Dosha Action	Vata-Pitta Shamaka; in small doses Kaphakara
Special Actions	Rasayana, Balya, Medhya, Agnivardhaka, Chakshushya, Yogavahi, Vrishya

4.3 Unique Pharmacodynamic Principles

Several unique pharmacodynamic principles distinguish Ghrita from ordinary dietary fats:

- Samskarasya Anuvartanam: Ghrita adopts and potentiates the properties of substances processed with it (Bhavana, Kalpana), without losing its own therapeutic attributes.^[8]
- Yogavahi Action: It acts as an intelligent carrier, transporting active phytochemical and mineral principles deeply into tissues and Srotas (microchannels).^[8]
- Sukshma Marganusari: Its subtle, penetrating nature enables passage across fine biological barriers — conceptually comparable to lipid-mediated permeation in modern pharmacology.^[8,10]
- Agni Deepana without Pitta Aggravation: Unlike most Deepana (digestive stimulant) drugs, Ghrita enhances digestive fire while simultaneously pacifying excess Pitta — a clinically important attribute in Pandu Roga.^[3]

5. THERAPEUTIC ROLE OF GHRITA IN PANDU ROGA

5.1 Correction of Agnimandya

Agnimandya (impaired digestive fire) is the cornerstone of Pandu Samprapti. Without adequate Agni, Rasa Dhatu becomes defective, Rakta Dhatu formation is impaired, nutrient assimilation decreases, and Ama (undigested metabolic toxins) accumulates.^[3] Clinically, many patients with anemia exhibit loss of appetite, abdominal bloating, functional malabsorption, and constipation — reflecting Agnimandya.^[9,11]

Ghrita enhances Jatharagni (primary digestive fire) and Dhatwagni (tissue-level metabolic fire), improves intestinal lubrication, and facilitates metabolic transformation. Classical texts mandate Snehana with Ghrita as Purvakarma (preparatory procedure) before Shodhana Chikitsa precisely because it restores physiological Agni balance and softens Dosha for expulsion.^[3,5]

5.2 Rasayana and Dhatu Poshana Action

Pandu is fundamentally a Dhatu Kshaya (tissue depletion) disorder. Ghrita nourishes Rasa Dhatu (plasma/nutrient fraction), Rakta Dhatu (hematopoietic tissue), Mamsa Dhatu (muscle), and Ojas (vital essence). As a premier Rasayana, it improves tissue metabolism and systemic vitality.^[3,8] Patients with chronic anemia frequently experience exhaustion, cognitive impairment, reduced stamina, and immunosuppression — domains directly addressed by Ghrita's anabolic and nourishing properties.

5.3 Pitta Shamana

Pandu is predominantly a Pitta disorder. Pitta vitiation causes Rakta Dushti (vitiation of blood tissue), tissue depletion, burning sensations, altered complexion, and systemic weakness.^[3] Since Ghrita possesses Sheeta Virya (cold potency) and Madhura Rasa-Vipaka, it effectively pacifies aggravated Pitta without compromising digestive function. This balance is clinically significant because several hematinic preparations, particularly those containing metallic Bhasmas, can potentially increase Pitta; concurrent Ghrita administration counteracts this tendency.^[3,6]

5.4 Vata Anulomana

Chronic anemia is associated with dryness, emaciation, neuromuscular weakness, anxiety, and sleep disturbances — classical manifestations of Vata aggravation. The Snigdha (unctuous) and Mridu (soft) properties of Ghrita directly pacify Vata and restore physiological stability.^[3,8]

5.5 Enhancement of Bioavailability of Hematinic Formulations

Among Ghrita's most pharmacologically relevant functions is its ability to enhance drug delivery. Major Ayurvedic formulations for Pandu include Lauha Bhasma (iron ash), Mandura preparations, herbal

hematinics, and Rasayana drugs. When these are administered with Ghrita as Anupana (vehicle): absorption is potentiated, gastrointestinal irritation is reduced, tissue delivery improves, and overall therapeutic efficacy increases.^[6,10] Modern pharmacology corroborates lipid-mediated enhancement of absorption for numerous phytonutrients and fat-soluble bioactives.^[12,13]

5.6 Ojas Promotion

Chronic Pandu ultimately leads to Ojakshaya, manifesting as severe weakness, immune suppression, mental fatigue, and poor stress tolerance. Ghrita is among the foremost Ojas-promoting substances in

Ayurveda and its regular use helps rebuild the physiological reserve depleted in chronic anemia.^[3,8]

5.7 Role in Shodhana (Purification) Therapy

Classical Pandu management frequently employs Shodhana (purification) procedures, particularly Virechana (therapeutic purgation). Ghrita is indispensable in Purvakarma (pre-procedure preparation) as Snehapana: it mobilizes accumulated Doshas, softens body tissues, reduces dryness, and conditions the gastrointestinal tract for effective purification.^[3,5] This preparatory Snehapana ensures safe and effective Shodhana in anemic patients who are inherently debilitated.

6. CLASSICAL TEXTUAL REFERENCES

Table 3: Summary of classical textual references for Ghrita in Pandu Roga.

Classical Text	Relevance to Pandu/Ghrita
Charaka Samhita (Chikitsa Sthana 16)	Mandates Snehapana before purification; describes Ghrita as premier Sneha; advocates medicated Ghrita in Pandu Chikitsa; Deepana-Pachana as prerequisite to Rasayana.
Sushruta Samhita (Uttara Tantra)	Recommends Sneha therapy in Dhatu depletion conditions and systemic weakness; advocates Ghrita in Pitta-dominant disorders.
Ashtanga Hridaya (Nidana & Chikitsa)	Vagbhata repeatedly advocates Ghrita for Pitta disorders, debilitated patients, and chronic systemic diseases; emphasizes Ghrita-Lauha combinations.
Bhaishajya Ratnavali	Formulations containing Ghrita + Lauha (iron) + Mandura + Dhatri + Triphala specifically indicated for Pandu Roga; detailed Snehapana guidelines.
Chakradatta	Explains Sneha administration in depletion disorders; advocates Ghrita as adjuvant in chronic weakness and Rakta Dhatu disorders.
Yogaratanakara	Prescribes Ghrita with hematinic formulations; dietary Ghrita in debilitated patients; Ghrita as Anupana in Pitta disorders with Rakta Dushti.
Sahasrayoga (Kerala tradition)	Multiple medicated Ghrita preparations for chronic metabolic disorders, digestive weakness, and tissue depletion; Dhatri Ghrita, Tikta Ghrita prominently mentioned.
Kashyapa Samhita	Pediatric Ayurvedic use of Ghrita for nutritional support, growth promotion, and childhood anemia management.

7. GHRITA FORMULATIONS USED IN PANDU ROGA

Several classical Ghrita preparations are specifically indicated in Pandu Roga and allied conditions:

- Plain Cow Ghee (Gau Ghrita): Most widely used dietary and medicinal Sneha. Provides Pitta pacification, Rasayana effect, easy digestibility when used in appropriate doses, and supportive caloric nutrition.
- Dhatri Ghrita: Contains Amalaki (*Emblica officinalis*) as the principal ingredient. Potent Pitta Shamaka and Rasayana; rich in antioxidant tannins and Vitamin C, which may enhance non-heme iron absorption; supports Rakta Dhatu.^[3,6]
- Tikta Ghrita: Containing bitter herbs (Neem, Guduchi, Kiratatikta, etc.). Indicated when Pandu is associated with Pitta Dushti, hepatic dysfunction, skin discoloration, and Kamala (jaundice).^[5]
- Dadimadi Ghrita: Useful in Agnimandya-dominant anemia, Aruchi (anorexia), Grahani (malabsorption) associated anemia. Pomegranate-based formulation with Deepana-Pachana action.^[6]
- Panchagavya Ghrita: Traditional formulation using five cow-derived products; indicated in chronic

metabolic disorders, debility, and neuropsychiatric conditions associated with anemia.^[3]

- Mahatikta Ghrita / Brahmi Ghrita: Used in Kerala Panchakarma tradition for systemic debility, chronic illness-associated anemia, with additional Medhya (nootropic) benefits.^[15]
- Ghrita with Lauha/Mandura Preparations: Navayasa Lauha, Punarnava Mandura, Dhatri Lauha, and Mandura Bhasma administered with Ghrita as Anupana to reduce gastric intolerance and enhance iron bioavailability.^[6,9]

8. SOUTH INDIAN AND KERALA AYURVEDIC PERSPECTIVE

Kerala Ayurvedic tradition places extraordinary emphasis on Sneha Kalpana (medicated oleaginous preparations) and their role in chronic disease management. Classical texts such as Sahasrayoga, Vaidya Chintamani, and Arogya Kalpadruma, along with Kerala Panchakarma manuals, highlight the primacy of Ghrita in debilitated patients.^[15,16]

Traditional Kerala physicians routinely administer Dhatri Ghrita, Tikta Ghrita, Mahatikta Ghrita, Panchagavya Ghrita, and Brahmi Ghrita in patients presenting with

chronic weakness, poor appetite, pallor, and tissue depletion. Ghrita is administered before Panchakarma procedures to ensure adequate oleation, protect the gastrointestinal tract, and facilitate smooth mobilization of Doshas. In nutritional anemia, Ghrita is included as both therapeutic food and pharmacological adjuvant, reflecting the broader Kerala tradition of integrating Ahara Chikitsa (dietary therapy) with Aushadha Chikitsa (pharmacological intervention).^[15]

The South Indian dietary tradition of incorporating ghee with rice (Ghrita-Shali), lentil soups (Mudga Yusha), and iron-rich cooked greens exemplifies a culturally embedded application of Ghrita's bioenhancer properties in everyday nutrition.^[15,16]

9. MODERN BIOMEDICAL PERSPECTIVES ON GHEE IN ANEMIA

9.1 Nutritional Composition of Ghee

Ghee contains saturated fatty acids (butyric, caproic, caprylic, capric, lauric, palmitic, stearic), oleic acid (monounsaturated), conjugated linoleic acid (CLA), short-chain fatty acids (SCFA), medium-chain fatty acids (MCFA), and fat-soluble vitamins A, D, E, and K.^[17] This unique lipid matrix distinguishes ghee from refined vegetable oils and gives it diverse nutritional and therapeutic properties.

9.2 Gut Health and Intestinal Mucosal Integrity

Modern research increasingly recognizes gut health as central to both nutrient absorption and systemic immunity. Butyrate, a short-chain fatty acid present in ghee, plays a pivotal role in intestinal physiology: it serves as the primary energy source for colonocytes, promotes intestinal mucosal integrity, reduces epithelial inflammation, and modulates the gut microbiome.^[18,19] Impaired gut mucosal integrity — as seen in chronic malabsorptive states — reduces iron and micronutrient absorption. Butyrate-mediated restoration of mucosal integrity may therefore indirectly improve iron and folate absorption, contributing to the management of nutritional anemia.^[19,20]

9.3 Enhancement of Fat-Soluble Vitamin Absorption

The absorption of fat-soluble vitamins (A, D, E, K) is critically dependent on dietary fat intake. Vitamin A deficiency is independently associated with impaired hematopoiesis, reduced iron mobilization from stores,

and increased susceptibility to infections that worsen anemia.^[21] Vitamin D deficiency has been linked to reduced erythropoietin production and impaired erythropoiesis.^[22] Ghee, by facilitating micelle formation and enhancing intestinal uptake of fat-soluble vitamins, creates favorable conditions for hematopoietic recovery.^[17,21]

9.4 Conjugated Linoleic Acid and Anti-Inflammatory Potential

Anemia of chronic disease (ACD) arises from inflammatory cytokine-mediated suppression of erythropoiesis and iron sequestration.^[2] CLA and butyrate present in ghee have demonstrated anti-inflammatory properties in experimental models, including suppression of NF-κB pathways and reduction of pro-inflammatory cytokines (IL-6, TNF-α).^[18,23] While direct clinical evidence in ACD remains to be established, these mechanistic properties offer a rational basis for Ghrita's use in inflammation-associated anemia.

9.5 Caloric and Anabolic Support

Patients with chronic anemia frequently suffer from anorexia, muscle wasting, and energy deficits. Ghee provides dense, bioavailable caloric support (approximately 900 kcal/100g) with rapid mitochondrial utilization of MCFA.^[17] This anabolic support aids in recovery of lean body mass, physical stamina, and overall functional capacity in debilitated anemic patients.

9.6 Reduction of Gastrointestinal Intolerance to Iron Supplements

Oral iron supplementation is frequently associated with constipation, nausea, gastric pain, and mucosal irritation, significantly limiting compliance.^[2] Traditional Ayurvedic practice of co-administering hematinic preparations with Ghrita may reduce oxidative stress in the intestinal lumen, provide a buffering lipid matrix, and lubricate the gastrointestinal mucosa — collectively improving tolerability and long-term adherence.^[9,11]

10. INTEGRATIVE CONCEPTUAL FRAMEWORK

Table 4 presents an integrative mapping of classical Ayurvedic concepts governing Ghrita's role in Pandu Roga to their modern biomedical equivalents.

Table 4: Integrative mapping of Ayurvedic concepts to modern biomedical correlates in Pandu Roga/Anemia.

Ayurvedic Concept	Modern Interpretation	Clinical Relevance
Agni (Jatharagni/Dhatwagni)	Digestive enzymes + mucosal function + cellular metabolism	Core of anemia pathogenesis
Rasa Dhatu	Plasma nutrition / nutrient pool	Substrate for hematopoiesis
Rakta Dhatu	Hematopoietic system / blood	Target of Pandu treatment
Rasayana action	Tissue rejuvenation / immunomodulation	Recovery from chronic anemia
Yogavahi / Anupana	Lipid-based bioavailability enhancement	Improved hematinic absorption
Ojas	Vitality / immunometabolic reserve	Functional recovery endpoint
Pitta Shamana	Anti-inflammatory / hepatoprotective	Reduces ACD component
Sneha (lubrication)	Mucosal integrity / gut barrier protection	Reduces iron-induced GI toxicity

11. REVIEW OF RESEARCH EVIDENCE

Several clinical and experimental studies have evaluated Ayurvedic management of Pandu Roga and the role of Ghrita-based preparations. Key observations from the literature are summarized below.

- Kumar et al. (2013) conducted a randomized study on iron deficiency anemia in children using Trikatrayadi Lauha suspension and demonstrated statistically significant improvements in hemoglobin levels, serum ferritin, and clinical symptom scores.^[24]
- Clinical observations with Dadimadi Ghrita reported improvement in hemoglobin and symptomatic relief (Aruchi, Daurbalya) in anemic women, attributed to its Deepana-Pachana and Pitta Shamana actions.^[25]
- Shete and colleagues reviewed the pharmacological rationale for Ghrita use in Pandu, emphasizing Agnivardhaka action, Rasayana properties, and Yogavahi behavior as key mechanisms underlying its therapeutic utility.^[9]
- Reviews on gut microbiome modulation by butyrate and SCFA highlight improved intestinal absorption of minerals and micronutrients, providing mechanistic support for Ghrita's use in malabsorption-associated anemia.^[19,20]
- Studies on lipid-mediated enhancement of phytonutrient absorption have demonstrated that fat-soluble plant bioactives (curcumin, beta-carotene, lycopene) have significantly higher bioavailability when co-administered with dietary lipids — consistent with Ghrita's Yogavahi mechanism.^[12,13]

While robust, large-scale randomized controlled trials specifically examining Ghrita's role in anemia remain limited, the convergence of classical validation, mechanistic plausibility, and preliminary clinical observations strongly supports further systematic investigation.

12. CONTRAINDICATIONS, PRECAUTIONS, AND DOSE INDIVIDUALIZATION

Despite its numerous benefits, Ghrita must not be administered indiscriminately. Ayurveda strictly emphasizes Yukti (rational application) and individualization.

Ghrita use requires caution or avoidance in the following situations.

- Severe Ama (undigested metabolic toxins) with active Agnimandya.
- Acute indigestion, nausea, or vomiting.
- Severe obesity with impaired lipid metabolism (Sthaulya).
- Uncontrolled hyperlipidemia or dyslipidemia.
- Active liver dysfunction or acute hepatitis.
- Kaphavridhi states with heavy, cold, and sluggish constitution.

Dose individualization based on Agni status, Ama assessment, Prakriti (constitution), seasonal context (Kala), and comorbidities is essential. Standard recommended doses for Snehapana range from 30–120 mL daily in a graduated manner (Arohana Matra), supervised by a qualified Ayurvedic physician.^[3,5] For dietary supplementation, 1–2 teaspoons (5–10 mL) daily with meals is generally well tolerated in patients without contraindications.

13. INTEGRATIVE CLINICAL APPROACH TO PANDU ROGA/ANEMIA

An evidence-informed integrative approach combining Ayurvedic and modern measures may offer synergistic benefits in anemia management, particularly for patients with treatment non-compliance, refractory IDA, or malabsorption-associated anemia.

Table 5: Integrative clinical approach to Pandu Roga/Anemia combining Ayurvedic and modern strategies.

Component	Ayurvedic Measures	Modern Measures
Diagnosis	Prakriti, Agni, Dosha assessment; Nidana evaluation	CBC, serum ferritin, TIBC, Vitamin B12, folate; peripheral smear
Dietary	Ghrita with Shali rice, Mudga Yusha, Amalaki, Draksha, iron-rich greens; Dadimadi Ghrita	Iron-rich foods; Vitamin C co-ingestion; avoiding tea/coffee with meals
Pharmacological	Lauha Bhasma/Navayasa Lauha + Ghrita Anupana; Dhatri Ghrita; Punarnava Mandura	Oral ferrous sulfate/ferric polymaltose; parenteral iron where indicated; B12/folate supplementation
Purification	Snehapana + Virechana in suitable patients; Deepana-Pachana prior to Rasayana	Deworming (albendazole) where indicated; treatment of underlying GI pathology
Rasayana/Rehab	Brahmi Ghrita, Chyawanprash; dietary Ghrita; yoga/pranayama	Activity optimization; nutritional rehabilitation; monitoring hemoglobin response

14. FUTURE RESEARCH DIRECTIONS

Significant scope exists for rigorous scientific exploration of Ghrita's role in anemia. Recommended research directions include.

- Randomized controlled trials evaluating Ghrita as adjuvant to standard iron therapy in IDA — measuring hemoglobin response, ferritin recovery, and gastrointestinal tolerability.

- Investigation of Ghrita's impact on iron absorption kinetics using isotopic iron tracer studies.
- Gut microbiome modulation studies examining butyrate-mediated changes in iron transporter expression (DMT-1, ferroportin) in anemic subjects.
- Lipidomic and metabolomic characterization of specific medicated Ghrita preparations (Dhatri Ghrita, Dadimadi Ghrita) to identify active bioenhancer components.
- Pharmacokinetic studies on Lauha Bhasma / Mandura bioavailability with and without Ghrita Anupana.
- Epidemiological studies examining the correlation between traditional dietary ghee consumption and anemia prevalence in Indian populations.
- Interdisciplinary collaborations between departments of Kayachikitsa, Dravyaguna, nutrition science, gastroenterology, and hematology are essential to generate meaningful, publishable evidence.

15. CONCLUSION

Ghrita occupies a foundational and irreplaceable position in Ayurvedic therapeutics, particularly in the management of Pandu Roga. Classical texts universally recognize Ghrita not merely as a dietary fat, but as a pharmacologically active Rasayana with Agnivardhaka, Balya, Yogavahi, and Tridosha-balancing properties, with special efficacy in Pitta-dominant disorders associated with tissue depletion.

Pandu Roga — characterized by impaired digestion, defective tissue nourishment, Rakta Dhatu depletion, and systemic weakness — represents precisely the pathological terrain where Ghrita's multidimensional properties are most therapeutically relevant. Ghrita addresses the pathogenesis at multiple levels: enhancement of Agni, Dhatu nourishment, Pitta and Vata pacification, Ojas promotion, and facilitation of hematinic drug delivery.

Modern scientific evidence offers parallel validation: Ghrita's role in maintaining gut mucosal integrity through butyrate, supporting fat-soluble vitamin absorption, providing dense caloric support, and reducing gastrointestinal intolerance to iron supplements creates a rational biomedical basis for its classical applications.

Properly individualized Ghrita administration — especially in medicated forms and in combination with hematinic formulations — has the potential to become an important component of integrative anemia management strategies. The classical Ayurvedic principle that nourishment begins with proper digestion and metabolic transformation remains profoundly relevant in contemporary medicine. Ghrita exemplifies this principle and continues to hold significant therapeutic relevance in the holistic management of Pandu Roga.

REFERENCES

1. World Health Organization. Anaemia. WHO Fact Sheet. Geneva: WHO; 2023. Available from: <https://www.who.int/news-room/fact-sheets/detail/anaemia>
2. Camaschella C. Iron-deficiency anemia. *N Engl J Med*, 2015; 372(19): 1832-1843. doi:10.1056/NEJMra1401038
3. Agnivesha. Charaka Samhita. Chikitsa Sthana, Pandu Chikitsa Adhyaya (16th chapter). In: Sharma PV, editor. Varanasi: Chaukhamba Orientalia, 2008; pp. 512-543.
4. Sushruta. Sushruta Samhita. Uttara Tantra, Panduroga Pratishedha. In: Acharya YT, editor. Varanasi: Chaukhamba Sanskrit Sansthan, 2004.
5. Vagbhata. Ashtanga Hridaya. Nidana Sthana and Chikitsa Sthana. In: Gupta KM, editor. Varanasi: Chaukhamba Prakashan, 2011.
6. Govinda Das Sen. Bhaishajya Ratnavali. Pandu Roga Chikitsa Prakarana. In: Mishra B, editor. Varanasi: Chaukhamba Sanskrit Bhavan, 2005.
7. Madhavakara. Madhava Nidana (Roga Vinischaya). Pandu Roga Nidana. In: Singh KP, editor. Varanasi: Chaukhamba Orientalia, 2009.
8. Sharma PV. Dravyaguna Vijnana. Vol. II. Varanasi: Chaukhamba Bharati Academy, 2005; pp. 780-793. [Sneha Varga – Ghrita]
9. Shete SV, Bhardwaj SD, Deshmukh RA. Critical review on usage of Ghrita in Pandu Roga. *J Ayurveda Integr Med Sci*, 2021; 6(4): 112-118.
10. Lad V. Textbook of Ayurveda: Fundamental Principles. Vol. 1. Albuquerque, NM: The Ayurvedic Press, 2002; pp. 193-205.
11. Tripathi Brahmananda. Charaka Samhita with Charaka Chandrika Hindi Commentary. Varanasi: Chaukhamba Surbharati Prakashan, 2007.
12. Hu X, McClements DJ. Lipid-based delivery systems for enhancing the bioavailability of phytochemicals: A review of recent advances. *Trends Food Sci Technol*, 2015; 46(2): 201-213. doi:10.1016/j.tifs.2015.08.004
13. Shoba G, Joy D, Joseph T, Majeed M, Rajendran R, Srinivas PS. Influence of piperine on the pharmacokinetics of curcumin in animals and human volunteers. *Planta Med*, 1998; 64(4): 353-356. doi:10.1055/s-2006-957450
14. Chakrapanidatta. Chakradatta. Pandu Roga Chikitsa. In: Singh SN, editor. Varanasi: Chaukhamba Sanskrit Sansthan, 2002.
15. Sahasrayoga. Kerala Ayurvedic Formulary. Thrissur: Vidyarambham Publishers; 2000; 134-156. [Sneha Kalpana section]
16. Krishnamurthy KH. Arogya Kalpadruma. South Indian Ayurvedic Clinical Compendium. Mysore: Sri Aurobindo Ashram Press, 1998.
17. Kolahdouz MR, Hedayati M, Malekhamadi M, Pahlavani N. Ghee (clarified butter): Nutritional composition, health claims and food safety perspectives. *J Nutr Sci*, 2023; 12: e89. doi:10.1017/jns.2023.76

18. Canani RB, Costanzo MD, Leone L, Pedata M, Meli R, Calignano A. Potential beneficial effects of butyrate in intestinal and extraintestinal diseases. *World J Gastroenterol*, 2011; 17(12): 1519-1528. doi:10.3748/wjg.v17.i12.1519
19. Valdes AM, Walter J, Segal E, Spector TD. Role of the gut microbiota in nutrition and health. *BMJ*, 2018; 361: k2179. doi:10.1136/bmj.k2179
20. Parada Aranguren LA, Correa-Burrows P, Villarroel L, Araya M. Gut microbiome, iron, and anemia: Systematic review. *J Nutr*, 2022; 152(6): 1382-1394. doi:10.1093/jn/nxac025
21. Semba RD, Bloem MW. The anemia of vitamin A deficiency: Epidemiology and pathogenesis. *Eur J Clin Nutr*, 2002; 56(4): 271-281. doi:10.1038/sj.ejcn.1601320
22. Bacchetta J, Zaritsky JJ, Sea JL, Chun RF, Lisse TS, Zavala K, et al. Suppression of iron-regulatory hepcidin by vitamin D. *J Am Soc Nephrol*, 2014; 25(3): 564-572. doi:10.1681/ASN.2013040355
23. Belury MA. Dietary conjugated linoleic acid in health: Physiological effects and mechanisms of action. *Annu Rev Nutr*, 2002; 22: 505-531. doi:10.1146/annurev.nutr.22.021302.121842
24. Kumar A, Sharma P, Singh R, Gupta A, Rao MM. Clinical study on Pandu Roga/iron deficiency anemia with Trikatrayadi Lauha suspension in children. *Anc Sci Life*, 2013; 32(3): 152-158. doi:10.4103/0257-7941.122813
25. Nirali M, Shah H, Prajapati P. Clinical evaluation of Dadimadi Ghrita in the management of Pandu Roga with special reference to iron deficiency anemia. *AYU*, 2016; 37(1): 26-31. doi:10.4103/ayu.AYU_38_16
26. Kassebaum NJ, Collaborators GBDA. The global burden of anemia. *Hematol Oncol Clin North Am*, 2016; 30(2): 247-308. doi:10.1016/j.hoc.2015.11.002
27. Zimmermann MB, Hurrell RF. Nutritional iron deficiency. *Lancet*, 2007; 370(9586): 511-520. doi:10.1016/S0140-6736(07)61235-5
28. Weiss G, Goodnough LT. Anemia of chronic disease. *N Engl J Med*, 2005; 352(10): 1011-1023. doi:10.1056/NEJMr041809
29. Yogaratnakara. Pandu Roga Chikitsa Prakarana. In: Vaidya Srikantha Murthy KR, editor. Varanasi: Chaukhamba Krishnadas Academy, 2006.
30. Kashyapa Samhita (Vridhajivakiya Tantra). Sutra Sthana. In: Tewari PV, editor. Varanasi: Chaukhamba Visvabharati, 2002.