

vii. Basic Pharmaceutical dosage forms and Secondary dosage forms of āyurveda

In Āyurveda, drug formulations (kalpanā) are broadly categorized into (1) **Basic dosage forms** (*mūla* or primary *kalpanā**) and (2) **Secondary dosage forms** (derivatives or *vikalpa kalpanā*). Foundational treatises like **Charaka Saṃhitā**, **Suśruta Saṃhitā**, and **Shāringadharasaṃhitā** classify these dosage forms based on preparation techniques (e.g., extraction with water, ghee, oil), fermentation, or mechanical processes. Additionally, classical authorities such as **Kashyapa** and **Shāringadharā** provide **age-specific** and **condition-specific** dosing schedules, ensuring both the safety and efficacy of medicinal interventions from infancy through adulthood. Below is an extensive review of these dosage forms, supplemented with data from **Shāringadharā Saṃhitā** and **Kasyapa**, as well as modern adaptations and usage contexts.

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Basic Ayurvedic Dosage Forms (Mūla Kalpanā)

Traditionally, five fundamental or “panchavidha” forms are recognized—**Swarasa** (expressed juice), **Kalka** (paste), **Kwatha** (decoction), **Hima** (cold infusion), and **Phāṇṭa** (hot infusion). However, for practical usage, many authors converge on three to five main forms.

Swarasa (Fresh Juice Extract)

- **Preparation:** Mechanical expression (mortar-pestle, cloth pressing) of fresh herb to yield potent juice.
- **Usage:** Typically used where concentrated potency is desired (e.g., *Tulsi* swarasa for acute respiratory symptoms).
- **Stability:** Short shelf life unless processed further (e.g., fermentation or addition of preservatives).

Kalka (Paste)

- **Definition:** A **semi-solid paste** achieved by grinding fresh or dried herbal material with minimal liquid.
- **Shāringadharā's Dosing:**
 - *Deepanīya* (appetizing) formulas → around **1 aksha** (~12 g).
 - *Jīvanīya / Samsamanīya* (vitalizing, balancing) → about **2 aksha**.
 - *Vamana/virechana* (emetic or purgative) → ~**½ aksha**.
 - **Rationale:** More potent or irritating forms used in smaller dosages, while milder daily supportive forms at larger doses.

Kwatha (Decoction)

- **Definition:** A **water-based decoction** prepared by boiling coarse powder in water, reducing to specified volume.
- **Examples:** *Daśamūla kashāya*, *Punarnavādi kaśāya*.
- **Shāringadharā's Dosing:**
 - *Vāta-Pitta-Kapha-hara* → ~**2 prasṛta** (pr. = ~25–50 ml each).
 - *Jīvanīya-Samsamanīya* → ~**4 prasṛta**.
 - *Vamana-virechana* → ~**1 prasṛta** (due to stronger effect).
- **Clinical Relevance:** Useful in subacute or chronic conditions; dosage adjusted per *doṣa* state or disease stage.

Hima (Cold Infusion) and Phāṇṭa (Hot Infusion)

- **Hima:** Soaking herbal powder in cold water for 8–12 hours, minimal heat, ensuring certain volatile or heat-labile compounds remain intact.
- **Phāṇṭa:** Infusing coarse powder in hot water briefly (~15 minutes), milder extraction than kwatha, preserving moderate heat-sensitive constituents.

Secondary Ayurvedic Dosage Forms (Vikalpa Kalpanā)

These formulations build upon the basic forms, applying **fermentation, trituration, or combining** with additional media (oil, ghee, sugar, etc.) to yield stable and specialized products.

Cūrṇa (Powder Form)

- **Definition:** Fine powder from one or multiple herbs.
- **Shāṅgadharā's Dosing:**
 - Deepaṇīya → "Agra parvāṅguli grahya" (approx. 2-3 g or "one finger measure").
 - Jīvāṇīya → ~2 pinches (pinch = ~500 mg?).
 - Vamana-virechana → ~½ pinch (due to strong effect).
- **Rationale:** Stronger or more irritant cūrṇa used in lesser amounts. Others can be used daily for digestive/metabolic support.

Guṭikā / Vaṭi (Pills/Tablets)

- Typically derived from **kalka** plus a binding medium (honey/ghee).
- Offer convenience, standardized dosing, longer shelf life.
- Classic examples: *Chitraka Haritakī Vaṭi*, *Kaishora Guggulu*, etc.

Āsava-Ariṣṭa (Fermented Preparations)

- Prepared by **fermenting** decoctions (kwatha) or juices with sugar or jaggery, enabling natural alcoholic fermentation (2-10% alcohol).
- Good for chronic diseases, relatively stable shelf life, improved palatability and absorption.
- Ariṣṭa typically from decoction; āsava from raw juice (swarasa).

Ghṛta (Medicated Ghee) and Taila (Medicated Oil)

- **Ghṛta:** **Kāsyapa pa** or text references mention increments in infant dosing (grain size, pinch, etc.).
- **Kasyapa's Guidelines for Ghṛta:**
 - Jātamātra (newborn) – "kolasthi," increasing gradually to "kola" by 1 month, "dwikola" at 3 months.
 - By 4-5 months – various forms (dry vs. fresh amalakī) adjusting to the child's digestive development.
- **Taila:** For external or internal use (nasya, abhyanga). E.g., *Anu taila*, *Mahānārayaṇa taila*.

Lehya (Confections) / Avaleha

- Thick paste from decoction plus sweeteners (jaggery, sugar, honey). Example: *Chyawanprāsh*, *Brahma rasāyana*.
- Palatable, stable forms for Rasāyana or daily supplementation.

Dose Guidelines: Insights from Shāṅgadharā and Kasyapa

Shāṅgadharā's Age-based Dose (Rathi/Masha)

1. **Child Dosing**
 - **First month** postpartum: ~1 rathi, incrementing by 1 rathi monthly until 1 year.
 - **At 1 year:** ~1 māshā.
 - Increase **1 māshā** every year up to 16 years → **16 māshā** = adult dose.
 - For ages **16-70**: stable at 16 māshā (approx. 12-16 g depending on region-specific definitions).

Kasyapa's Ghṛta Dosage for Infants

- **Jātamātra:** Minimal "kolasthi" or "kolārdha" from the 20th night.
- **1 month:** ~1 kola.
- **3 months:** ~2 kola (dwikola).
- **4 months:** "Sushka āmalakī" portion.

- **5-6 months:** “Ardra āmalakī” portion for added nutritional synergy.

Such age-tiered schedules reflect the progressive development of an infant's digestive and metabolic capacity, ensuring gentle assimilation of medicated ghee or herbal additions.

Contemporary Relevance and Applications

1. Manufacturing Standards

- GMP guidelines under **Schedule T** demand uniform dosing forms (chūrṇa, kvātha, etc.) with consistent potency, validated by modern analytical tools (HPTLC, HPLC).
- Understanding classical dosage references helps calibrate modern unit-based labeling (e.g., mg, ml) in line with regulatory demands.

2. Clinical Trials

- RCT designs for classical formulations often adapt the suggested dose from references like Shāringadhara or Kasyapa, correlating approximate rathi/māshā to metric equivalents (1 māshā ~1 g or variable regionally).
- Pediatric or geriatric populations can thus be safely included, with age-based adjustments gleaned from classical guidelines.

3. Teaching and Global Dissemination

- Āyurvedic institutions integrate these dosage forms into pharmaceutics (Bhaishajya Kalpanā) curricula, bridging textual data with practical production.
- Exports or cross-border usage of chūrṇas, ghṛtas, or arishtas must reference classical authenticity and handle dosage disclaimers in SI units for consumer clarity.

Future Directions

1. Standardization

- Converting *rathi*, *māshā*, *prasṛta* references into consistent metric measures fosters international acceptance.
- Detailed monographs in the *Ayurvedic Pharmacopoeia of India (API)* illustrate the transformations from ancient weights to modern grams/milliliters.

2. Research

- Investigating synergy among basic forms (like swarasa + taila) in specific diseases.
- Evaluating the effect of fermentation times, ghee-sneha processes, or mineral incineration on the final bioavailability.

3. Innovative Dosage Forms

- Nano-technological versions of classical forms (e.g., nano-ghṛta capsules, freeze-dried kvātha granules).
- Maintains classical compositions but ensures extended shelf life, exact dosing, and global compliance for shipping or large-scale distribution.

Below is a **summarized table** capturing **Basic (Mūla) Ayurvedic dosage forms**, **Secondary (Vikalpa) forms**, **classical references**, **key preparation details**, **dosage guidelines** from **Shāringadhara** and **Kasyapa**, and **modern relevance**.

Dosage Form	Classical Source & Definition	Key Preparation & Example	Shāringadhara / Kasyapa Dose Guidance	Contemporary Relevance
1. Swarasa (Expressed Juice)	- One of the 5 mūla kalpanā ; fresh juice of plants.- Earliest textual mention: <i>Charaka Saṃhitā</i> , <i>Suśruta Saṃhitā</i> .	- Obtained by crushing fresh herbal materials (leaves, stems) in a mortar & pressing through cloth.- E.g., <i>Tulsi</i> (<i>Ocimum sanctum</i>) juice.	- Infants: Typically minimal usage, often not standard in Kasyapa's direct list but occasionally recommended in small droplet forms.- General adult: Doses vary (10-20 ml) depending on potency	- Quick assimilation; short shelf life.- Used in modern research to isolate labile constituents (e.g., antioxidant assays for fresh <i>Tulsi</i>).- E.g., in R&D or limited daily dosage forms.

2. Kalka (Paste)	<ul style="list-style-type: none"> - Another primary form (<i>mūla kalpanā</i>).- <i>Kalka</i> = semisolid paste from powdered or fresh herbal mass. 	<ul style="list-style-type: none"> - Prepared by grinding in mortar with minimal water/ghee.- Common in daily usage for external applications (e.g., <i>Lepa</i>) or internal with honey/ghee. 	<ul style="list-style-type: none"> - Shāringadhara:- <i>Deepaniya</i> (appetizer): ~1 Aksha (approx. 12 g).- <i>Jīvanīya-Samsamāniya</i>: 2 Aksha.- <i>Vamana-virechana</i>: ~½ Aksha (due to potent nature). 	<ul style="list-style-type: none"> - Modern factories may convert <i>kalka</i> into tablets or capsules for shelf stability.- Topical usage remains widely practiced (e.g., <i>Lepa</i> for inflammatory conditions).
	<ul style="list-style-type: none"> - Most ubiquitous form among <i>mūla kalpanā</i>.- Water-based decoction: herb is boiled, then reduced to a specified fraction. 	<ul style="list-style-type: none"> - E.g., <i>Daśamūla Kaṣāya</i>, <i>Punarnavādi Kwatha</i>.- Adjust water volume & boiling time per textual references. 	<ul style="list-style-type: none"> - Shāringadhara:- <i>Vāta-Pitta-Kapha-hara</i>: ~2 <i>prasṛta</i> (25-50 ml × 2).- <i>Jīvanīya-Samsamāniya</i>: 4 <i>prasṛta</i>.- <i>Vamana-virechana</i>: 1 <i>prasṛta</i>.- Kasyapa: More on <i>ghṛta</i> & infant schedules, less direct <i>kwatha</i> mention for neonates. 	<ul style="list-style-type: none"> - Frequently used in outpatient & inpatient setups for chronic disorders.- Modern labeling: standard single-dose pouches or freeze-dried granules for convenience, ensuring consistency (HPTLC fingerprint).
4. Hima (Cold Infusion) / Phāṇṭa	<ul style="list-style-type: none"> - Hima: Herbal soaking in cold water (6-12 hr), minimal heat.- <i>Phāṇṭa</i>: Mild hot infusion (~15 min). 	<ul style="list-style-type: none"> - Hima: e.g., <i>Dhānyaka Hima</i> from coriander seeds.- <i>Phāṇṭa</i>: mild extraction, preserving moderate heat-labile constituents. 	<ul style="list-style-type: none"> - Typically smaller volumes (1-2 <i>prasṛta</i>) used for mild conditions or specific <i>doṣa</i>.- Not heavily enumerated by <i>Kasyapa</i> for child usage, but recommended in certain <i>Pitta</i> or heat-labile cases for gentle extraction. 	<ul style="list-style-type: none"> - Used when certain compounds degrade under high temp.- In R&D labs, tested for gentler extraction methods correlating with "cold pressed" product lines, e.g., commercial mild infusions.
	<ul style="list-style-type: none"> - A secondary dosage form (<i>vikalpa</i>), though some classify it under basic forms.- Fine powder of single or multiple herbs. 	<ul style="list-style-type: none"> - E.g., <i>Triphala Cūrṇa</i>, <i>Hingvāṣṭaka Cūrṇa</i>.- Mechanically ground, sieved, stored in airtight containers. 	<ul style="list-style-type: none"> - Shāringadhara:- <i>Deepaniya</i> (appetizer): "Agra parvāṅguli grahya" (~2-3 g).- <i>Jīvanīya-Samsamāniya</i>: ~2 pinches.- <i>Vamana-virechana</i>: ½ pinch.- <i>Kasyapa</i>'s direct references revolve around <i>ghee</i> formula for neonates, but <i>cūrṇa</i> dosage can be adjusted to child's capacity 	<ul style="list-style-type: none"> - Widely commercialized: sachets, bottled powders.- Manufacturers adopt GMP guidelines, ensuring minimal humidity, stable shelf life, e.g., <i>Triphala</i>, <i>Sitopaladi Cūrṇa</i>.
5. Cūrṇa (Powder)	<ul style="list-style-type: none"> - Secondary derivative from <i>kalka</i> with binding mediums.- Offers convenience, standardized dosage, longer shelf. 	<ul style="list-style-type: none"> - E.g., <i>Kaishora Guggulu</i>, <i>Chitraka Haritakī Vati</i>. 	<ul style="list-style-type: none"> - Shāringadhara doesn't detail child dosage extensively for <i>vati</i>, but adult usage ~1-2 tablets (~1-2 g).- Infants: occasionally small "pills" dissolved in honey. 	<ul style="list-style-type: none"> - Pill machines and automated lines in large Ayurvedic companies produce consistent sized tablets.- Favored for exports (easy labeling in mg or grains).
	<ul style="list-style-type: none"> - Fermented from <i>kwatha</i> (<i>ariṣṭa</i>) or <i>swarasa</i> (<i>āsava</i>) with sugar/jaggery, ~2-10% ethanol. 	<ul style="list-style-type: none"> - Classic examples: <i>Aśvagandhāriṣṭa</i>, <i>Arjuna-āriṣṭa</i>, <i>Punarnavāsava</i>. 	<ul style="list-style-type: none"> - Shāringadhara gives general guidelines: ~4 to 6 teaspoons daily for adult.- <i>Kasyapa</i> for pediatric usage typically not recommended (due to alcohol). 	<ul style="list-style-type: none"> - Popular in chronic diseases management; robust shelf-life, minimal refrigeration.- Modern QC includes verifying ethanol percentage, microbial load, ensuring no contamination.

8. Ghṛta (Medicated Ghee)	<p>- A secondary form derived from basic extracts combined into ghee.- Kasyapa details infant usage in progressive increments.</p>	<p>- <i>Kalyāṇaka Ghṛta, Mahātiktaka Ghṛta, etc.</i>- Various dravyas processed with ghee for deeper tissue effect.</p>	<p>- Kasyapa's schedule for neonates/infants:- 0-1 month: minimal "kola-sthi" or "kola-ardha." - 1 month: "kola." 3 months: "dwi-kola." 4-5 months: "sushka/ardra āmalaki" references.- Shāringadhara references adult usage ~1-2 tsp daily or condition-based.</p>	<p>- Some ghṛtas are "Rasāyana" i.e. potent rejuvenators.- Modern R&D explores nanoemulsion forms for improved bioavailability.</p>
9. Lehya / Avaleha (Confections)	<p>- Thick paste from decoction + sweeteners (jaggery/sugar/honey).- Often used as <i>rasāyana</i> or daily supplement.</p>	<p>- E.g., <i>Chyawanprāśa, Brahma rasāyana</i>.- Cooked to specific consistency, ensuring a thick jam-like form.</p>	<p>- Shāringadhara: typical dose ~1-2 tsp for adult (10-12 g).- Children: half or quarter spoon depending on age from 2 yrs onward.- Kasyapa rarely specified direct "avaleha" for neonates but some mild formulations allowed after 6 months.</p>	<p>- Highly commercial with major brands (e.g., <i>Dabur Chyawanprash, Patanjali Chyawanprash</i>).- Clinical trials exploring immunomodulatory, antioxidant effects with standardized polyphenol content.</p>

Key Observations:

1. Age-Based Dosing:

- *Shāringadhara* and *Kasyapa* specify incremental dosage for neonates to adolescents, ensuring safe assimilation based on physiological growth.
- *Rathi-māshā-prasṛta* units approximate to grams or milliliters in modern practice, though regional conversions vary.

2. Strength of Formulations:

- Potent or purgative forms (e.g., for *virechana*) typically require smaller doses.
- Daily tonics (e.g., *Jivaniya, Rasāyana*) can be administered in larger or more frequent doses.

3. Contemporary Manufacturing:

- Industries adapt classical references to GMP protocols (Schedule T), advanced quality checks (HPTLC, HPLC), standardized packaging, and labeled SI-based doses for global acceptance.

Conclusion

The **basic pharmaceutical dosage forms** (*swarasa, kalka, kvātha, hima, phāṇṭa*) and **secondary dosage forms** (*cūrṇa, vati, āsava-ariṣṭa, ghṛta, lehyam, etc.*) anchor Āyurvedic therapeutics, reflecting millennia of **textual** and **clinical** refinement. **Shāringadhara** and **Kasyapa** provide authoritative dosing schedules tailored to **age** and **physiological capacity**, ensuring rational, safe, and context-specific usage. Modernization—through GMP, advanced standardization, and metric conversions—integrates classical knowledge into **contemporary manufacturing** and **research**, preserving the **holistic** essence of Āyurveda while advancing its global viability and scientific credibility.