LITERATURE REVIEW STANA, STANYA

Stana Sharir Rachana and Kriya

❖ **Synonyms for Stana**
   According to Amarkosha, Kuchauo is the synonym of Stana. Stana, Urasija, Vakshoj, Payodhara, Cucha are mentioned in Rajnighantu.\(^{21}\)
   Stanagra (Nipple of the breast) is also referred as Chucukam or Kuchagra. Stanamukh, Vrutta, Shikha are also mentioned as synonyms for stanagra (nipple).\(^{22}\)

❖ **Stana Sharir**\(^{23}\)
   Stana also called as payodhara is one of the 56 pratyangas. Though Stana are formed in both males and females its functions differ. In females after attaining puberty the stana attain fullness while in males it remains in rudimentary form. In garbhini and sootika (pregnancy and lactation) it is filled with stanya (breast milk).

❖ **Stana Sampat**
   Stana should not be too high, too small or too big. It should not be sagging. Nipple should be well formed by which the infant is able to suckle breast milk with ease.\(^{24}\)

❖ **Stana Nirmiti(formation)** – Matruj Avayava

❖ **Sthana** – Urah(Chest)\(^{25}\)

❖ **Stana Vishishtata (Characteristic feature of Stana(Breasts)**
   When a female attains puberty Stana enlarge and during pregnancy and lactation period they are filled with breast milk. The stana(breasts) of a male do not undergo any change in their lifetime.\(^{26}\)

❖ **Srotasa**
   Bahirmukha Srotasa. In Males there are nine bahirmukha srotasas while in females three more have been described. Two in the stana and one in the yonimarga ‘Rajovaha srotasa’\(^{27,28,29}\)
   Acharya Sushrut has mentioned Stana as moolasthana of Shukravaha srotasa\(^{30}\).
Peshi –
Overall there are 500 peshi (muscles) in the body. In females there are 20 more.
5 peshi in each stana. These peshi develop during puberty.\textsuperscript{31}

Marma
Total of 9 marmas reside in the ura (Chest region). Hridaya, Stanamula, stanarohit, Apalapa and Apastambha\textsuperscript{32}

- **Stanamula** - Kalantara pranahara (gradual deterioration) sira marma, situated two fingers below the stana on either side. Injury to this marma causes kasa (cough) and shwasa(dyspnoea) resulting in death.\textsuperscript{32}

- **Stanarohita** –Kalantara pranahara mansa marma, situated at both the breasts, two fingers above the nipple or stanachuchuka. Injury to this marma causes lohitapurna koshtha(congestion in the lungs), Kasa(cough) shwasa(dyspnoea) and gradual deterioriation resulting in death.\textsuperscript{32}

- **Apastambha**- Kalantar pranahara sira marma, situated in the thorax bilaterally. Injury to this marma causes vatapurnakoshthata (pneumothorax), kasa(cough) and shwasa(dyspnoea) and gradual deterioriation resulting in death.\textsuperscript{32}

Dhamani – Twenty-four dhamani originate from the nabhi. 10 dhamani nourish the upper part of the body. These 10 dhamani after reaching the heart subdivide into three branches thus forming 30. Of these 30, 2 Dhamani reside in the breast to secrete breast milk.\textsuperscript{33}

Sira – There are forty sira in the thorax & out of these following fourteen sira should be avoided – two in the pericardium, two in each Stanamula, eight on the sides of Stanrohita, Apalap & Apastambha.\textsuperscript{34}

**Stana roga**
In childhood the dhamanis residing in the breast are very constricted due to which vitiated doshas cannot penetrate to cause imbalance. In childbearing age (pregnancy or lactation period) these dhamanis enlarge thus can be vitiated and cause stana roga(breast disease).\textsuperscript{35}
Samprapti of Stana Vidradhi Roga:

Vitiation of Doshas cause dushti in the stana (breast) of a lactating or non-lactating female, vitiate rakta and mansa dhatu thus cause ‘Stana-Roga(Vidradhi)’.36

Types: Vata, Pitta, Kapha, Sannipatika, Aagantuja

Kriya Sharir – Physiology

Stanya

❖ Stanyashaya

Organ where stanya (breast milk) gets collected and is secreted through the stanachuchuka

❖ Nirmiti(formation) – Matruj Avayava

❖ Sthana – Urah(Chest)

❖ Dosha – Kapha

❖ Dhatu – Rasa

❖ Upadhatu – Stanya

❖ Definition of Stanya

Stanya – that which is secreted through Stana.

Stanya is one of upadhatu of Rasa.37

❖ Lakshan (Properties)–

The cream part of Rasa formed from the digestion of food, which is madhur (sweet) gets accumulated in the stana and termed as ‘Stanya’. Just as Shukra (semen) is present in the whole body but gets secreted by the thought or sight of a beautiful woman, in the same way stanya is formed from aahar rasa in a female but is secreted by the touch, sight or thought of child.38

✔ Pandur(White)

✔ Madhur(sweet)

✔ Nirdosha(Without any imperfections)

✔ Sheeta (cool)

✔ Snigdha (unctuous)
✓ Dissolves in water
✓ Avivarna (clear)

❖ Karya (Functions) –
Nourishment of the organ stana. \(^40\)
Nourishment of the infant

❖ Causes of Dysfunction: \(^41\)

Dietary causes:
- Excessive intake of Lavan (Salt), Katu (hot and spicy), Kshara (alkali)
- Abhishyandi (Diet aggravating Kapha dosha) Praklinna bhojana (Food which is decomposed)
- Excessive intake of Paramanna (kheer or various sweets prepared in oil or ghee), Guda (jaggery), Mandak (partially formed curds), Dadhi (curds), intake of Mansa (chicken, pork, fish etc)
- Excessive intake of Madya (Alcohol)
- Asatmya bhojan (food which is unaccustomed to the body)
- Vishamashana (food taken at irregular time and in irregular proportion)
- Viruddhashana (incompatible food)
- Atyashana (overeating)

Habitual Causes:
- Withholding or forcefully eliminating natural urges
- Daytime sleep immediately after having meals
- Keeping awake till late night
- Over exertion

External causes:
- Due to abhighata (accident due to physical trauma)
- Chronic disease
- Emaciation
Psychological causes:
- Mental irritation (Sudden mental shock or stress)
- Chinta (over-anxiety or worry)
- Krodha (Anger)

Samprapti of Stanya Dushti:
Due to improper diet or mental stress
Dosha Dushti (vitiation of dosha)
Stanyavah Sira Dushti (vitiation of Stanyavaha sira)
Stanya Dushti (vitiation of Breast milk)

Stana Keelaka:\(^{42}\)
If lactating mother eats foreign body with food, it does not get digested in pachyamanavashtha and pakavashtha. Undigested foreign body get converted in kleda, circulates with Rasa dhatu and Vata dosha and reaches stanyavaha sira (the mammary gland). This causes obstruction of srotasa and acute disease of breast. (Ka.su.19)

Stana Keelaka Roopa(signs & symptoms):\(^{43}\)
Signs :Stiffness and secretion in breasts, Veinulas, Inflammation, Pain, Tenderness
Symptoms :Indigestion, Palpitation, Giddiness, Body ache, Anorexia, Joint pain, Headache, Redness of eyes or Sneezing, Nausea due to kaph, Fever,Excessive thirst, Loose motions, Obstruction of urine and Burning sensation of breasts.

Clever physician named it as ‘stan vidradhi’ (mammary abscess) as it causes obstruction in body as nail.

Stanakeelaka according to Dosha dominance – \(^{44}\)
**Vata Dominance** - the abscess increases in size.
**Pitta Dominance** –accelerates inflammation and suppuration of Stanakeelaka (Mammary abscess) at an early stage.
**Kapha Dominance** –Slows process of pathology causing a chronic abscess.
Treatment of Stanakilaka :-

1. Ghruta paana (Internal Oleation with clarified butter). Due to this the tracts often becomes smooth internally thereby facilitating easy removal of the stankilak. Regular expulsion of breast milk is advised by proper massaging.

2. Sheetaseka (Application of cold compress)

3. Pralepa (external application of medications over the breast)

4. Virechana (Purgation treatment with medication)

5. Pathya Bhojana (dietary regimen) to keep a check over the doshas.

With the help of this treatment if the abscess is in primary stage then it gets healed or else it has to be treated with Incision and drainage.
LITERATURE REVIEW OF STANA (BREASTS) 
FROM MODERN MEDICAL SCIENCE

Mammary Gland (Breasts)

Anatomy & Physiology

The breasts is found in both sexes, but it is rudimentary in the male. It is well developed in the female after puberty. The breast is a modified sweat gland. It forms an important accessory organ of the female reproductive system, & provides nutrition to the new born in the form of milk.

Situation – The breasts lies in the superficial fascia of the pectoral region. A small extension called the axillary tail pierces the deep fascia & lies in the axilla.

Extent – 1) Vertically it extends from the second to the sixth rib.
     2) Horizontally it extends from the lateral border of the sternum to the mid axillary line.

Development

1. Partly from mesoderm - blood vessels and connective tissue
2. Partly from ectoderm - cellular elements

1. The breasts develop from an ectodermal thickening called the mammary ridge or milk line. This ridge extends from axilla to the groin. It appears during the 4th week of intrauterine life, but in humans it disappears over most of its extent persisting only in the pectoral region. The gland is ectodermal and the stroma is mesodermal in origin.

2. The persisting part of the mammary ridge is onverted into a mammary pit. Secondary buds grow down from the floor of the pit. These buds divide and subdivide to form lobes of the gland. The entire system is first solid, but later canalized. At birth or later the nipple is everted at the site of the original pit.

3. Growth of mammary glands, at puberty, is caused by estrogens. Apart from oestrogens, development of secretory alveoli is stimulated by progesterone and by lactogenic hormone of the hypophysis cerebri.
Changes seen in the Breast at various stages of Life

**Before puberty** - Are of small size, but enlarge as the generative organs become more completely developed.

**During Pregnancy** - Increase during pregnancy and especially after delivery

**Old Age** - Become atrophied. Much of the glandular and ductal tissue is replaced with fatty tissue and breasts become less dense. Ligaments also lose their elasticity when women age, causing the breasts to sag.

**Structures of the Breast** - The structure of the breast may be conveniently studied by dividing into the skin, the parenchyma which consists of glandular tissue & the stroma which comprises of fibrous tissue and fatty tissue.

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**Figure 1. Structure of Breast**

A) **The Skin** – It covers the gland & presents the following features.

1) **Mammary Papilla** or **Nipple** (*papilla mammae*) A Conical projection called the Nipple is present just below the centre of the breast at the level of the fourth intercostal space. The nipple is pierced by 15 to 20 lactiferous ducts. It contains circular & longitudinal smooth muscle fibres which can make the nipple stiff or flatten it; respectively. It has a few modified sweat & sebaceous glands. It is rich in its nerve supply & has many sensory end organs at the termination of the nerve fibres.

2) **Areola** - The skin surrounding the base of the nipple is pigmented & forms a circular area called the Areola. This region is rich in modified sebaceous glands, particularly at its outer margin. These become enlarged during pregnancy & lactation to form raised tubercles. Oily secretions of these glands lubricate the nipple & areola & prevent them from cracking during lactation. Apart from sebaceous glands, the areola also contains some sweat glands & accessory mammary glands. The skin of the areola & nipple is devoid of hair, & there is no fat subjacent to it.
B) The Parenchyma – It is made up of glandular tissue which is of a pale reddish color firm in texture and secretes milk. The gland consists of 15 to 20 lobes; they are termed the tubuli lactiferi. Each lobe is a cluster of alveoli, and is drained by lactiferous duct. The lactiferous duct converge at the nipple and open on it. Near its termination each duct has a dilatation called the lactiferous sinus or ampullæ, which serve as reservoirs for the milk.

Alveolar epithelium is cuboidal in its resting phase, and columnar during lactation. During pregnancy the alveoli enlarge, and the cells undergo rapid multiplication. At the commencement of lactation, the cells in the center of the alveolus undergo fatty degeneration, and are eliminated in the first milk, as colostrum corpuscles. The peripheral cells of the alveolus remain, and form a single layer of granular, short columnar cells, with spherical nuclei, lining the basement membrane. The cells, during the state of activity of the gland, are capable of forming, in their interior, oil globules, which are then ejected into the lumen of the alveolus, and constitute the milk globules. When the acini are distended by the accumulation of the secretion the lining epithelium becomes flattened.

C) The Stroma – It forms the supporting frame work of the gland.

The fibrous tissue invests the entire surface of the mamma. It forms septa, known as the suspensory ligaments (Of Cooper) which anchor the skin & gland to the Pectoral fascia. The fatty tissue covers the surface of the gland, and occupies the interval between its lobes. It usually exists in considerable abundance, and determines the form and size of the gland. There is no fat immediately beneath the areola and papilla.

Muscles of Pectoral Region:
- **Pectoralis Major** – Originates from Ant. Surface of medial half of clavicle, Half the breadth of anterior surface of sternum upto 6th costal cartilages, second to sixth costal cartilages, Aponeurosis of the external oblique muscle of the abdomen. It is inserted by a bilaminar tendon on the lateral lip of the bicipital groove. The two laminae are continuous with each other inferiorly. Nerve supply is through medial and
lateral pectoral nerves.

- **Pectoralis Minor** – 3rd, 4th, 5th ribs, near the costochondral junction, intervening fascia covering external intercostal muscles. Insertion is into medial border and upper surface of the coracoid process. Nerve supply is through medial and lateral pectoral nerves.

- **Subclavius** – First rib at the costochondral junction. Insertion into subclavian groove in the middle 1/3rd of the clavicle. Nerve supply to the subclavius is from upper trunk of brachial plexus.

**Vessels and Nerves —**

**Arteries** – The arteries are derived from the thoracic branches of the axillary, the intercostals, and the internal mammary.

**Veins** - The veins describe an anastomotic circle around the base of the papilla, called by Haller the circulus venosus. From this, large branches transmit the blood to the circumference of the gland, and end in the axillary and internal mammary veins.

**Lymphatics** - The breast lymph nodes include:
- supraclavicular nodes – above the collarbone
- infraclavicular (or subclavicular) nodes – below the collarbone
- axillary nodes – in the armpit (axilla)

There are about 30–50 lymph nodes in the axilla. The number varies from woman to woman. The axillary lymph nodes are divided into 3 levels according to how close they are to the pectoral muscle on the chest:
- level I (low axilla) – located in the lower or bottom part of the armpit, along the outside border of the pectoral muscle
- level II (mid axilla) – located in the middle part of the armpit, beneath the pectoral muscle
- level III (high axilla) – located below and near the centre of the collarbone, above the breast area and along the inside border of the pectoral muscle.

When breast cancer spreads, it usually goes to level I lymph nodes first, to level II next and then to level III.
Nerves

Fig. 2. Breast Lymph Nodes

- internal mammary nodes – inside the chest around the breastbone (sternum)
- Some lymph from the breast also reaches the cephalic node, the posterior intercostal nodes & the subdiaphragmatic & subperitoneal lymph plexuses.

Addition, far greater growth

Development of the Breasts

The breasts, begin to develop at puberty. This development is stimulated by the estrogens of the monthly female sexual cycle; estrogens stimulate growth of the breasts’ mammary glands plus the deposition of fat to give the breasts mass. In addition, far greater growth occurs during the high-estrogen state of pregnancy, and only then does the glandular tissue become completely developed for the production of milk.


All through pregnancy, the large quantities of estrogens secreted by the placenta cause the ductal system of the breasts to grow and branch. Simultaneously, the stroma of the breasts increases in quantity, and large quantities of fat are laid down in the stroma. Also important for growth of the ductal system are at least four other hormones: growth hormone, prolactin, the adrenal glucocorticoids, and insulin. Each of these is...
known to play at least some role in protein metabolism, which presumably explains their function in the development of the breasts.

**Progesterone Is Required for Full Development of the Lobule-Alveolar System.**
Final development of the breasts into milk-secreting organs also requires progesterone. Once the ductal system has developed, progesterone—acting synergistically with estrogen, as well as with the other hormones mentioned—causes additional growth of the breast lobules, with budding of alveoli and development of secretory characteristics in the cells of the alveoli. These changes are analogous to the secretory effects of progesterone on the endometrium of the uterus during the latter half of the female menstrual cycle.

**Prolactin Promotes Lactation**
Although estrogen and progesterone are essential for the physical development of the breasts during pregnancy, a specific effect of both these hormones is to inhibit the actual secretion of milk. Conversely, the hormone prolactin has exactly the opposite effect on milk secretion—promoting it. This hormone is secreted by the mother’s anterior pituitary gland, and its concentration in her blood rises steadily from the fifth week of pregnancy until birth of the baby, at which time it has risen to 10 to 20 times the normal non-pregnant level. In addition, the placenta secretes large quantities of human chorionic somatomammotropin, which probably has lactogenic properties, thus supporting the prolactin from the mother’s pituitary during pregnancy. Even so, because of the suppressive effects of estrogen and progesterone, no more than a few milliliters of fluid are secreted each day until after the baby is born. The fluid secreted during the last few days before and the first few days after parturition is called colostrum; it contains essentially the same concentrations of proteins and lactose as milk, but it has almost no fat and its maximum rate of production is about 1/100 the subsequent rate of milk production.

Immediately after the baby is born, the sudden loss of both estrogen and progesterone secretion from the placenta allows the lactogenic effect of prolactin from the mother’s pituitary gland to assume its natural milk-promoting role, and over the next 1 to 7 days, the breasts begin to secrete copious quantities of milk instead of colostrum. This secretion of milk requires an adequate background secretion of most of the mother’s other hormones as well, but most important are growth hormone,
cortisol, parathyroid hormone, and insulin. These hormones are necessary to provide the amino acids, fatty acids, glucose, and calcium required for milk formation.

After birth of the baby, the basal level of prolactin secretion returns to the nonpregnant level over the next few weeks. However, each time the mother nurses her baby, nervous signals from the nipples to the hypothalamus cause a 10- to 20-fold surge in prolactin secretion that lasts for about 1 hour, which is also shown in . This prolactin acts on the mother’s breasts to keep the mammary glands secreting milk into the alveoli for the subsequent nursing periods. If this prolactin surge is absent or blocked as a result of hypothalamic or pituitary damage or if nursing does not continue, the breasts lose their ability to produce milk within 1 week or so. However, milk production can continue for several years if the child continues to suckle, although the rate of milk formation normally decreases considerably after 7 to 9 months.

**Hypothalamus Secretes Prolactin Inhibitory Hormone.**

The hypothalamus plays an essential role in controlling prolactin secretion, as it does for almost all the other anterior pituitary hormones. However, this control is different in one aspect: The hypothalamus mainly stimulates production of all the other hormones, but it mainly inhibits prolactin production. Consequently, damage to the hypothalamus or blockage of the hypothalamic-hypophysial portal system often increases prolactin secretion while it depresses secretion of the other anterior pituitary hormones.

Therefore, it is believed that anterior pituitary secretion of prolactin is controlled either entirely or almost entirely by an inhibitory factor formed in the hypothalamus and transported through the hypothalamic-hypophysial portal system to the anterior pituitary gland. This factor is called prolactin inhibitory hormone. It is almost certainly the same as the catecholamine dopamine, which is known to be secreted by the arcuate nuclei of the hypothalamus and can decrease prolactin secretion as much as 10-fold.

**Hormonal changes at Menopause:**

By the time a woman reaches her late 40s and early 50s, menopause is beginning or is well underway. At this time, the levels of estrogen and progesterone begin to fluctuate, with levels of estrogen dramatically decreasing. This leads to many
of the symptoms commonly associated with menopause. With this reduction in the stimulation by estrogen to all tissues of the body, including the breast tissue, there is a reduction in the glandular tissue of the breasts. Without estrogen, the connective tissue of the breast becomes dehydrated and inelastic, and the breast tissue, which was prepared to make milk, shrinks and loses shape. This leads to the "sagging" of the breasts often associated with women of this age.
LITERATURE REVIEW OF ARBUDA

Literature review from ancient Sanskrit literature & Ayurvedic samhitas

- **Vedic Period**

The disease was even prevalent during the Vedic period. In Rugveda, it has been mentioned that arbuda is just like a danava & is destroyed by Indra. Rugved tikakar Sayan says that arbuda is ambu (water) to destroy it use Agni (agnikarma).

**References from Atharvaveda**

In the ancient classics, Arbuda has not mentioned directly but the diseases like Apachi, Gulma, Granthi & Gandamala which resembles the clinical features of Arbuda have been mentioned.

- Just as the physician treat the diseases like Gandamala (Cervical lymphadenopathy) by the rays of the sun & moon along with medicines, in same way human being by acquiring knowledge destroy the innocence.\(^{46}\)
- Just as good physician treat the diseases like Gandamala (Cervical lymphadenopathy), in the same way human being should overcome his drawbacks.\(^{47}\)
- Just as Gandamalas (Cervical lymphadenopathy) become dry or green some times, in a same way bad feelings become weak & strong sometimes\(^ {48}\). Atharvaveda has mentioned some charm for curing tumours called gayanya.

**Vyutpatti** \(^ {49}\)

“Arbuda” is constituted of the root word “Arba“ and the verb “Udeti”

The word arbuda has been derived from the root “Arb” with suffix “Ena” along with augmentation of “Nd,” which means “to destroy”, “to kill” or to “hurt”. The verb “Udeti” means to elevate, to rise. Grammatically, it denotes the fleshy outgrowths.
Arbuda Nirukti –
1) Mansapindakara Rogabhede (a fleshy mass)
2) Tatsankhyateshu Dashakotisankhya (number of 10 billion—may be interpreted as uncontrolled multiplication of cells)
3) Parvatbhede (a mountain)
4) Asurabhede (a demon)
5) Kadrabhede Sarpabhede (a demon(i.e., a serpent)
6) Megha (Clouds)
7) Mansapindabhide (a swelling)

During the Vedic period, arbuda was considered as a serpent like demon that was conquered by “Lord Indra”.

Definition of Arbud
Vata, Pitta Kapha doshas having got aggravated in any part of the body and afflicting the Mansa dhatu, produce a circular, fixed, slightly painful, big, broad based slow growing non-suppurating and dense elevation (swelling) of mansa. The same is called as “arbuda” by the scholars. Aggravation of these doshas and vitiation of rasa-rakta-mansa-medha dhatus in stana can lead to causation of dushta stanarbuda¹⁹.

Nidan Panchak
Dosha – Vata, Pitta, Kapha
Dushya – Rasa-Rakta⁵⁰, Mansa⁵¹, Meda⁵²
Agni – Dhatvagni dushti
Srotasa – Rasavaha, Raktavaha, Mansavaha srotasa⁵³, Medovaha
Marg – Bahya roga marga⁵⁴
Sthana – Anywhere in the body

Characteristics of Arbud –
✓ Arbud is bigger than granthi
✓ Has the predominance of kapha dosha and meda dhatu, is sthira (fixed/hard) hence does not suppurate.⁵⁵
✓ Elevated swelling.⁵⁶
Purvarupa of Arbuda –
Purvarupa of arbud has not been mentioned in the ancient texts.

Rupa of Arbuda (signs and symptoms)
There are six types of arbud mentioned in the texts. 57, 58

1. Vataja Arbud –
   Characterised by pain - pricking or splitting sensation, Black discolouration, feels hard on touch, feels like distended bladder and secretes clear fluid if it bursts open

2. Pittaj Arbud 59 –
   Characterised by burning sensation, severe irritation similar to that caused by burns, hot to touch, red or yellow discolouration and when burst discharges hot & excessive amount of blood.

3. Kaphaja Arbud –
   Is cold to touch, minimal discolouration or no discolouration, slight pain, severe itching, secretes white, thick pus when it bursts open.

4. Raktarbuda 60, 61 –
   This arbud is characterized by elevated swelling (lump of muscle) caused due to vitiated doshas. These vitiated doshas cause contration in rakta (blood) & sira (blood vessels) thus creating muscular lump which is covered with fleshy buds. There is very less or no suppuration. It grows very fast. There is continuous discharge of blood. It is considered incurable and the person suffers from complication like anaemia.

5. Mansarbud 62 –
   This arbud is caused due to trauma of a fist or any type of blow. This causes injury to the muscles which get vitiated and swollen. It is non-suppurating, stony hard and fixed. A person who has excessive intake of mansa (non-veg food) is prone to this type of arbud due to further vitiation of the mansa dhatu.

6. Medoja Arbud 63 –
   This arbud is smooth, big in size, increases and decreases according to the body fat. It doesn’t cause much pain. When it bursts open discharges secretion like pinyak (oil-cake) or sarpi (ghee).
Aahariya Nidan of Arbuda – (Dietary factors in causation of Arbud) & Samprapti

Arbud bears resemblance with granthi and shotha. The causation of mansaja granthi is specified as excessive use of mansavardhak aahar (consumption of meat). Medoja granthi is caused by excessive intake of medovardhak aahar (fatty food).

Samprapti:

- Dosha prakop (Aggrevation of dosha in any part of the body)
  - Dhatu dushti - especially Mansa dushti (vitiation of dhatu)
    - Vitiation of Mansa dhatu causes Mansa elevation (swelling)

Formation of Arbud

Characteristic features of Arbud:

- Gatra Pradesh (anywhere in the body)
- Vrutta (round)
- Sthir (fixed)
- Mandruja (Slightly painful)
- Mahant (big)
- Analpamoola (which is deep seated)
- chirvruddhi (which grows slowly)
- Apaka (which does not suppurate)

This characteristic is seen because of the dominance of Kapha dosha & meda dhatu & also because of the immobilization & binding of doshas in them. Tumours do not undergo suppuration because predominance of Kapha dosha & meda dhatu.

Upadrava –

When there is occurrence of arbud at the same site of prevailing arbud or after the excision of earlier arbud it is called Adhyarbud.

Dwirarbud can be defined as arbud occurring at the same or other site, at the same time or after sometime of occurrence of the earlier arbud.
**Sadhyasadhyata of Arbud** – (curability of Arbud)\(^{65}\)

<table>
<thead>
<tr>
<th>Kashta Arbud (Difficult to cure)</th>
<th>Asadhya Arbud (incurable)</th>
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</thead>
<tbody>
<tr>
<td>Vata</td>
<td>Raktarbud</td>
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<tr>
<td>Pitta</td>
<td>Mansarbud</td>
</tr>
<tr>
<td>Kapha</td>
<td>Adhyarbud</td>
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<tr>
<td>Meda</td>
<td>Dwirarbud</td>
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</table>

Arbud becomes asadhya
- ✓ if there is oozing of secretions from the arbud
- ✓ if it is affecting marmsthana (vital points)
- ✓ if the arbud is affecting the srotasa
- ✓ if it is fixed
- ✓ if it develops adhyarbud or dwirarbud.

**Chikitsa - Sutra of Arbuda :-** \(^{66}\)

There is similarity between Granthi and Arbuda with respect to pradesha (site), akruti, Dosha and Dushya. Hence, the physician should apply the treatment mentioned for granthi.

- **Shodhana** – Vaman and Virechana
- **Swedana** – Hot fomentation at the site of Arbuda
- **Vilayana** – Causing ripening in the apakva granthi using ashma, wood, thumb pressing etc.
- **Agni Karma** – If the Granthi is ripe or fully matured it should be cauterized.
- **Vrana Karma** – Performing the treatment advised in wounds
- **Shastrkarma**- If the Granthi cannot be cauterized or if it is cauterized partially i.e. if it is deep rooted it can grow again. Hence, it is advisable to excise it totally.
CANCER

Introduction & History:
The Greek term carcinoma is the medical term for a malignant tumor derived from epithelial cells. Hippocrates described several kinds of cancers. He called benign tumours oncos, Greek for swelling, and malignant tumours carcinos, Greek for crab or crayfish. This name comes from the appearance of the cut surface of a solid malignant tumour, with "the veins stretched on all sides as the animal the crab has its feet, whence it derives its name" He later added the suffix -oma, Greek for swelling, giving the name carcinoma. It is Celsus who translated carcinos into the Latin cancer, also meaning crab. Galen used "oncos" to describe all tumours, the root for the modern word oncology.

Definition:-
1. **Cancer:** Cancer is derived from Latin root word “CANERUM” and Greek word “KARKINOS” which means one animal – Crab. The crab once grabs the patients with its invading pioneers, doesn’t let it go until the victim croaks. Cancer is cellular tumor the natural course of which is fatal and usually associated with formation of secondary tumours.
2. **Neoplasm:** It is made of two words, NEOS +PLASUM. In Greek word “Neos” meaning new. “Plasum” meaning third formed i.e. new and abnormal growth in a different way from their non-malignant ancestors. Neoplasm is a mass of new tissue, which persists and grows independent of its surrounding structures and which has no physiological use.
3. **Tumour:** Tumor is derived from Latin root word “Tumex” i.e. to Swell. Tumor is an abnormal mass of tissue, which exceeds and is uncoordinate with that of normal tissues and persists in the same excessive manner.

How does Cancer occur?
Cancer is a genetic disease in its origins. Progression from normal tissue to invasive cancer is thought to take place over 5 to 20 years and is influenced by hereditary
genetic factors as well as somatic genetic changes. Cancer progression is a multistep process driven by a series of accumulating genetic or epigenetic changes. The hallmark of cancer is uncontrolled growth.

All cancers begin in cells, the body's basic unit of life. To understand cancer, it's helpful to know what happens when normal cells become cancer cells.

The body is made up of many types of cells. These cells grow and divide in a controlled way to produce more cells as they are needed to keep the body healthy. When cells become old or damaged, they die and are replaced with new cells.

Normal Cell Cycle\textsuperscript{68,69}

Cell division is the process by which cells reproduce (mitosis). The cell cycle is a series of changes the cell goes through from the time it is first formed until it divides into two daughter cells. It starts at mitosis (M-phase) and ends with mitosis. In between are the G-1, S, and G-2 phases. The duration of S, M and G-2 are relatively constant in different tissues. Between the M-phase and the S-phase is a gap (G-1) where production of RNA, proteins, and enzymes needed for DNA synthesis occurs. The duration of G-1 varies and determines the length of the cell cycle. The S-phase is when DNA synthesis occurs.

Between the S-phase and M-phase is a second gap (G-2). Cells are thought to prepare for mitosis in G-2 when specialized proteins and RNA are produced. G-0 is a dormant phase.

The four phases of mitosis are:

1. **Prophase** – consists of 4 steps - Centrosomes separate and migrate to opposite poles; Centrioles separate; Chromatin is transformed into chromosomes composed of pairs of filaments called chromatids (each is a complete genetic copy of its chromosome); The nuclear membrane disappears.

2. **Metaphase** - Paired chromosomes become lined up between the centrioles.
3. **Anaphase** - Chromatids are pulled toward the centrioles. One chromatid from each pair goes to each daughter cell.

4. **Telophase** (divided into parts I and II)
   a. Telophase I - Chromosomes become more polarized and transformed into thread-like structures; A nuclear membrane forms around each set of chromosomes forming a new nucleus with a nucleolus; The centrioles duplicate.
   b. Telophase II - Actual dividing of the cell occurs (cytokinesis); Cytoplasm splits and two daughter cells are formed;

However, sometimes this orderly process goes wrong. The genetic material (DNA) of a cell can become damaged or changed, producing mutations that affect normal cell growth and division. When this happens, cells do not die when they should and new cells form when the body does not need them. The extra cells may form a mass of tissue called a tumor. Not all tumors are cancerous; tumors can be benign or malignant.

- **Benign tumors** aren't cancerous. They can often be removed, and, in most cases, they do not come back. Cells in benign tumors do not spread to other parts of the body.
- **Malignant tumors** are cancerous. Cells in these tumors can invade nearby tissues and spread to other parts of the body. The spread of cancer from one part of the body to another is called metastasis.

Fig. 4. The stages of tumor development. A malignant tumor develops across
time, as shown in this diagram. This tumor develops as a result of four mutations, but the number of mutations involved in other types of tumors can vary. We do not know the exact number of mutations required for a normal cell to become a fully malignant cell, but the number is probably less than ten.

a. The tumor begins to develop when a cell experiences a mutation that makes the cell more likely to divide than it normally would.

b. The altered cell and its descendants grow and divide too often, a condition called hyperplasia. At some point, one of these cells experiences another mutation that further increases its tendency to divide.

c. This cell's descendants divide excessively and look abnormal, a condition called dysplasia. As time passes, one of the cells experiences yet another mutation.

d. This cell and its descendants are very abnormal in both growth and appearance. If the tumor that has formed from these cells is still contained within its tissue of origin, it is called in situ cancer. In situ cancer may remain contained indefinitely.

e. If some cells experience additional mutations that allow the tumor to invade neighboring tissues and shed cells into the blood or lymph, the tumor is said to be malignant. The escaped cells may establish new tumors (metastases) at other locations in the body.

Sometimes tumours do not stay harmlessly in one place. They destroy the part of the body in which they originate and then spread to other parts where they start new growth and cause more destruction. This characteristic distinguishes cancer from benign growths, which remain in the part of the body in which they start. Although benign tumours may grow quite large and press on neighbouring structures, they do not spread to other parts of the body. Frequently, they are completely enclosed in a protective capsule of tissue and they typically do not pose danger to human life like malignant tumors (cancer) do.

Although cancer is often referred to as a single condition, it actually consists of more than 100 different diseases. These diseases are characterized by uncontrolled growth and spread of abnormal cells. Cancer can arise in many sites and behave differently depending on its organ of origin. Breast cancer, for example, has different
characteristics than those of lung cancer. It is important to understand that cancer originating in one body organ takes its characteristics with it even if it spreads to another part of the body. For example, metastatic breast cancer in the lungs continues to behave like breast cancer when viewed under a microscope, and it continues to look like a cancer that originated in the breast.

Cancer types can be grouped into broader categories. The main categories of cancer include:

- **Carcinoma** - cancer that begins in the skin or in tissues that line or cover internal organs. There are a number of subtypes of carcinoma, including adenocarcinoma, basal cell carcinoma, squamous cell carcinoma, and transitional cell carcinoma.
- **Sarcoma** - cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue.
- **Leukemia** - cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of abnormal blood cells to be produced and enter the blood.
- **Lymphoma and myeloma** - cancers that begin in the cells of the immune system.
- **Central nervous system cancers** - cancers that begin in the tissues of the brain and spinal cord.

**Breast Cancer**

Breast cancer is a malignant tumor that starts in the cells of the breast. A malignant tumor is a group of cancer cells that can grow into (invade) surrounding tissues or spread (metastasize) to distant areas of the body. The disease occurs almost entirely in women, but men can get it, too. According to the research done up to now some factors which can contribute towards the occurrence of Breast cancer. Of these some are known while some are considered as probable factors in the occurrence. These are termed as risk factors.
Risk Factors for Breast Cancer

- **Sex** - Most breast cancers occur in women. The main reason women develop breast cancer is because of the effects of hormones – the breast cells of women are exposed to the female hormones estrogen and progesterone. These hormones, especially estrogen, are associated with breast cancer and encourage the growth of some breast cancers.

- **Age** - The risk of developing breast cancer increases with age. The longer a woman lives, the greater her chances of developing breast cancer. The risk of breast cancer increases each decade until menopause. At menopause, the risk slows down or levels off. However, breast cancer is more common after menopause. Breast cancer mostly occurs in women between the ages of 50 and 69 years of age.

The following factors are known to increase the risk of developing breast cancer.

- **Personal history of breast cancer**
  Women who have had breast cancer are at an increased risk of developing breast cancer again. This new primary breast cancer can develop in the same breast where the first cancer started or in the opposite breast. Women who have a history of carcinoma in situ are at an increased risk of developing breast cancer: Ductal carcinoma or Lobular carcinoma in situ increases the risk of invasive breast cancer.

- **Family history of breast cancer**
  A family history of breast cancer means that one or more close blood relatives have or had breast cancer. Some families have more cases of breast cancer than would be expected by chance. Sometimes it is not clear whether the family's pattern of cancer is due to chance, shared lifestyle factors, an inherited (hereditary) factor that has been passed on from parents to children through genes or a combination of these.

- **The risk of developing breast cancer is increased if:**
  - one or more first-degree relatives (such as a mother, sister or daughter) had breast cancer, especially if they were diagnosed before menopause
• Having one first-degree relative with breast cancer approximately doubles a woman's risk.
• The more first-degree relatives with breast cancer, the greater the risk.
• Second-degree relatives (such as a grandmother, aunt or niece) from either side of the family who had breast cancer. The risk with second-degree relatives is not as much as the risk with first-degree relatives.
• a relative had cancer in both breasts (bilateral breast cancer) before menopause
• 2 or more relatives had breast cancer or ovarian cancer
• a relative had both breast cancer and ovarian cancer
• a male relative had breast cancer
• a relative had other multiple cancers

♦ **Breast Density** - Breasts that have larger amounts of connective, gland and milk duct tissues than fatty tissue are considered dense. Breast density can only been seen on a mammogram. On a mammogram, fatty tissue looks dark, while dense tissue looks white, like tumours, so it can hide a cancer. Women with dense breasts have a 4 to 6 times greater risk of breast cancer compared to women with little or no dense breast tissue.

♦ **BRCA gene mutations**
Genetic mutations are changes to a gene, which can increase the risk of developing cancer. Inherited gene mutations are passed on from a parent to a child. Only a small portion of breast cancers (about 5–10%) are caused by inheriting a gene mutation. Mutations in BRCA1 (breast cancer gene 1) and BRCA2 (breast cancer gene 2) make some women more susceptible to developing breast cancer. These genes appear to play a role in controlling the growth of cancer cells. They are called tumour suppressor genes. BRCA1 and BRCA2 mutations are rare, occurring in approximately 1 in 500 people.

Studies have shown that women with inherited BRCA1 or BRCA2 gene mutations have up to an 80% lifetime risk of developing breast cancer. Women with an inherited mutation of these genes have an increased risk of developing
breast cancer at a younger age (usually before menopause) compared to others. Women with a BRCA gene mutation also have an increased risk of developing cancer in both breasts (bilateral breast cancer). If they develop cancer in one breast, they have an increased risk of developing cancer in the other breast. BRCA gene mutations also increase the risk of a woman developing ovarian cancer at any age.

♦ **Ethnicity** - Ashkenazi Jewish ancestry (Eastern European ancestry) have an increased risk of developing breast cancer. This is because BRCA1 and BRCA2 gene mutations are more common in Ashkenazi women. About 1 in 40 Ashkenazi Jewish women carry a BRCA gene mutation, compared with 1 in 500 in the general population.

♦ **Rare genetic conditions**
  There are some rare inherited genetic conditions that are associated with an increased breast cancer risk

Genetic Mutations in the following Genes:
- **TP53 (Tumor suppressor gene)** - Li-Fraumeni syndrome – People with Li-Fraumeni syndrome have an increased risk of developing several specific types of cancer, such as breast cancer, osteosarcoma, soft tissue sarcoma and leukemia.
- **ATM gene** - Ataxia-telangiectasia (AT) – This gene is responsible for repairing damaged DNA. Certain families with a high rate of breast cancer have been found to have mutations of this gene.
- **PTEN (Tumor suppressor gene)** - Cowden syndrome – Cowden syndrome is a rare disease that predisposes people to breast cancer, gastrointestinal cancers and thyroid cancer.
- **STK 11(also known as LKB1- Tumor suppressor gene)**- Peutz-Jeghers syndrome – This disorder increases the risk of developing gastrointestinal, breast, ovarian and testicular cancers.
- **CHEK2** (tumour suppressor gene) increases breast cancer risk when it is mutated. CHEK2 mutations have been identified in some families with Li-Fraumeni syndrome.

- **Reproductive history**
  Estrogen is the main hormone associated with breast cancer. Estrogen affects the growth of breast cells. It is believed to play an important role in breast cancer cell growth. The type and duration of exposure to estrogen influences the chances of breast cancer developing.

- **Early menarche**
  Beginning to menstruate (menarche) at an early age (11 or younger) increases the length of time women are exposed to estrogen and other hormones. This increases the risk of breast cancer.

- **Late menopause**
  Menopause occurs as the ovaries stop producing hormones and the level of hormones (mainly estrogen and progesterone) in the body drops. This causes a woman to stop menstruating. Later age at menopause (after age 55) increases the length of time women are exposed to estrogen and other hormones. This increases the risk of breast cancer. Likewise, menopause at a younger age decreases the length of time breast tissue is exposed to estrogen and other hormones and has been associated with a lower risk of breast cancer.

- **Late pregnancy or no pregnancies**
  Pregnancy interrupts the exposure of breast cells to circulating estrogen and reduces the total number of lifetime menstrual cycles. Women who have their first full-term pregnancy after the age of 30 have a slightly higher risk of breast cancer than women who have at least one full-term pregnancy at an earlier age. Becoming pregnant at an early age (such as before age 20) reduces breast cancer risk.

- **Parity**
  The more children a woman has, the greater the protection against breast cancer.
Not becoming pregnant at all (called nulliparity) increases the risk of breast cancer.

♦ **Exposure to ionizing radiation**

Women who receive radiation therapy to the lymph nodes in the chest, neck and armpit (mantle radiation field) for Hodgkin lymphoma have an increased risk of breast cancer. The increase in risk is relative to the women's age during treatment. The risk of breast cancer is increased if mantle radiation therapy for Hodgkin lymphoma was given before the age of 30. Risk is further increased if the radiation treatment was given during puberty. Breast cancer risk is greatly increased if chemotherapy is combined with radiation therapy to treat Hodgkin lymphoma before the age of 15 years. The benefit of treating the cancer usually far outweighs the risk of developing a second cancer from radiation therapy treatment. In the past, medical radiation therapy was used to treat health problems such as tuberculosis, postpartum mastitis, acne or an enlarged thymus gland. Women who were given medical radiation therapy to the chest area for these diseases are at an increased risk of developing breast cancer.

Women who were exposed to ionizing radiation during the atomic bomb blasts are also at an increased risk of developing breast cancer, especially if they were exposed during puberty.

♦ **Hormone replacement therapy**

Research shows that prolonged use of hormone replacement therapy (HRT), especially estrogen plus progestin (called combined HRT), increases the risk of breast cancer. Data were pooled from numerous studies, and the analysis showed an increased risk of breast cancer with long-term (5 years or longer) use of combined HRT for current or recent users.

The findings of the Women's Health Initiative (WHI) study showed the risk of breast cancer went up by about 1% for every year that women took estrogen alone and about 8% for every year that they took combined HRT. Increased risk was even seen with comparatively short-term use of combined HRT compared to placebo. The increased risk appears to disappear a few years after stopping HRT.
♦ Oral contraceptives
Oral contraceptives that contain both estrogen and progesterone cause a small increase in the risk of breast cancer, especially among women who have used oral contraceptives for 10 or more years. The increased risk disappears after stopping oral contraceptives. However, current and recent (less than 10 years since last use) users have a slight increased risk compared with women who have never used oral contraceptives.

♦ Atypical hyperplasia
Atypical hyperplasia is a condition where there is an increased number of abnormal (atypical) cells in the breast tissue. Atypical hyperplasia increases a woman's risk of developing breast cancer.

♦ Alcohol
Drinking alcohol increases a woman's risk of breast cancer. Even low levels of alcohol consumption (just over 1 drink per day) can increase a woman's risk of breast cancer. The risk increases with the amount of alcohol consumed. One possible reason for this is that alcohol is thought to cause higher levels of estrogen. Alcohol may also decrease some essential nutrients that protect against cell damage, such as folate (a type of B vitamin), vitamin A and vitamin C.

♦ Being obese
Obesity increases the risk of breast cancer in post-menopausal women. Studies have shown that women (who had never taken hormone replacement therapy) with a body mass index (BMI) of 31.1 or higher had a 2.5 times greater risk of developing breast cancer than those with a BMI of 22.6 or lower. Ovarian hormones, estrogens in particular, play an important role in breast cancer. Many of the risk factors for breast cancer are believed to result from the cumulative dose of estrogen to the breast tissue. The ovaries make most of the body's estrogen, but after menopause fat tissue produces a small amount of estrogen. Having more fat tissue can increase estrogen levels and increase the chances of breast cancer developing.
High socio-economic status

Breast cancer risk is slightly increased in women with higher incomes. This may be because they tend to start having children later in life or have fewer children. They may also be more likely to take hormone replacement therapy after menopause. These lifestyle factors are linked to an increased risk of breast cancer.

Possible risk factors

The following factors have some association with breast cancer, but there is not enough evidence to say they are known risk factors. Further study is needed to clarify the role of these factors for breast cancer.

Physical inactivity – Studies show that greater physical activity is associated with a lower risk of breast cancer, for both premenopausal and post-menopausal breast cancer. The research evidence suggests very strongly that physical inactivity is a risk factor for breast cancer. There are a number of studies that are looking into the role of exercise in breast cancer.

Adult weight gain – There is consistent evidence from studies that adult weight gain is a probable cause of post-menopausal breast cancer. It is not certain whether reducing weight would reduce the risk of breast cancer.

Birth weight – Evidence suggests that exposures early in life may have important effects on cancer risk – such as high concentrations of maternal estrogens during pregnancy and increased breast cancer development later in life. Greater birth weight raises circulating maternal estrogen levels, exposing the fetus to more estrogen and possibly increasing the risk of premenopausal breast cancer.

Some benign breast conditions – Most benign (non-cancerous) breast conditions do not increase a woman's risk of developing breast cancer. However, there may be a relationship between benign breast conditions, such as fibrocystic breast changes, and family history of breast cancer. Some benign breast conditions may slightly increase a woman's risk of breast cancer if they are associated with an increased number (overgrowth) of cells: hyperplasia, complex fibroadenoma, sclerosing adenosis, papillomatosis, and radial scar.
Unknown risk factors
The following are factors for which there is not enough evidence or the evidence is inconclusive. In other words, it can't be determined for sure whether these risk factors are or are not associated with breast cancer. Diethylstilbestrol (DES), High-fat diet, Soy, environmental exposures, a diet low in vegetables and fruit

Signs and Symptoms
Signs and symptoms of breast cancer are:

- **Lump in the breast** – the most common first sign, the lump is usually first felt by the person. Sometimes the lump is found on a screening mammogram before it can be felt. The lump is present all the time and does not get smaller or go away with the menstrual cycle. The lump may feel like it is attached to the skin or chest wall and cannot be moved. The lump may feel hard, irregular in shape and very different from the rest of the breast tissue. The lump may be tender, but it is usually not painful. Pain is more often a symptom of a non-cancerous (benign) condition, but should be checked by a doctor.

- **Lump in the armpit (axilla)** - Sometimes small, hard lumps in the armpit may be a sign that breast cancer has spread to the lymph nodes. Although these lumps are often painless, they may be tender.

- **Changes in breast shape or size** - A change in the shape or size of the breast may signal a problem.

- **Skin changes** - The skin of the breast may become dimpled or puckered. A thickening and dimpling of the skin is sometimes called orange peel skin, or *peau d'orange*. Redness, swelling and increased warmth (signs that look like an infection) may be a sign of inflammatory breast cancer. Itching of the breast or nipple may be a sign of inflammatory breast cancer. Itchiness is often not relieved by ointments, creams or other medications.

- **Nipple changes** - Crusting, ulcers or scaling on the nipple may be a sign of some rare types of breast cancer such as Paget's disease of the breast.

- **Discharge from the nipples** This can be caused by many conditions, most of which are benign. But discharge from one nipple may be a sign of breast
cancer, especially if it appears without squeezing the nipple (is spontaneous) and is blood-stained.

**Late signs and symptoms**

Late signs and symptoms occur as the cancer grows larger or spreads to other parts of the body, including other organs.

- bone pain
- nausea, loss of appetite, weight loss and jaundice
- shortness of breath, cough and buildup of fluid around the lungs (pleural effusion)
- headache, double vision and muscle weakness.

**Types of Breast Cancer**

**Ductal Carcinoma**

**Ductal** means that the cancer starts inside the milk ducts, **carcinoma** refers to any cancer that begins in the skin or other tissues (including breast tissue) that cover or line the internal organs—such as breast tissue.

**Ductal carcinoma in situ (DCIS):** *in situ* means "in its original place."

Thus, ductal carcinoma in situ is breast cancer in the duct cells that has not invaded
deeper or spread through the body. Women diagnosed with DCIS have a high likelihood of being cured. Ductal carcinoma in situ (DCIS) is the most common type of non-invasive breast cancer. DCIS is called "non-invasive" because it hasn’t spread beyond the milk duct into any normal surrounding breast tissue. DCIS isn’t life-threatening, but having DCIS can increase the risk of developing an invasive breast cancer later on.

**Invasive ductal carcinoma (IDC):** Invasive means that the cancer has “invaded” or spread to the surrounding breast tissues. Invasive ductal carcinoma refers to cancer that has broken through the wall of the milk duct and begun to invade the tissues of the breast. Over time, invasive ductal carcinoma can spread to the lymph nodes and possibly to other areas of the body.

**Features –**
- The most common type of breast cancer. (About 80% of all breast cancers diagnosed are IDC)
- Two-thirds of women diagnosed with IDC are 55 or older.
- Invasive ductal carcinoma also affects men.

**Sub-types of Invasive Ductal Carcinoma:**

**IDC Type: Tubular Carcinoma of the Breast**

Tubular carcinomas are usually small (about 1 cm or less) and made up of tube-shaped structures called "tubules." These tumors tend to be low-grade, meaning that their cells look somewhat similar to normal, healthy cells and tend to grow slowly. Due to advancement in screening technologies tubular carcinomas are being diagnosed more frequently often before a lump is felt. Tubular carcinomas may account for anywhere from just under 8% to 27% of all breast cancers.

**Features:**
- The average age of diagnosis for tubular carcinoma is the early 50s, although women can be diagnosed with it at any age.
- This type of cancer is rare in men.
• Though tubular carcinoma is an invasive breast cancer, it tends to be a less aggressive type that responds well to treatment.
• It isn't likely to spread outside the breast and is considered to have a very good prognosis.

**IDC Type: Medullary Carcinoma of the Breast**
Medullary carcinoma of the breast is a rare subtype of invasive ductal carcinoma (cancer that begins in the milk duct and spreads beyond it), accounting for about 3-5% of all cases of breast cancer. It is called “medullary” carcinoma because the tumor is a soft, fleshy mass that resembles a part of the brain called the medulla.

• **Features:**
  Can occur at any age, but it usually affects women in their late 40s and early 50s.
• Is more common in women who have a BRCA 1 mutation.
• Cells are usually high-grade in their appearance and low-grade in their behavior i.e. they look like aggressive, highly abnormal cancer cells, but they don’t act like them.
• Medullary carcinoma doesn’t grow quickly and usually doesn’t spread outside the breast to the lymph nodes.

Hence, it’s typically easier to treat than other types of breast cancer.

**IDC Type: Papillary Carcinoma of the Breast**
An invasive papillary carcinoma usually has a well-defined border and is made up of small, finger-like projections. Often it is grade 2, or moderate grade, on a scale of 1 to 3 — with grade 1 describing cancer cells that look and behave somewhat like normal, healthy breast cells, and grade 3 describing very abnormal, fast-growing cancer cells. In most cases of invasive papillary carcinoma, ductal carcinoma in situ (DCIS) is also present. (DCIS is a type of cancer in which the carcinoma cells are confined to the breast duct).
**Features:**
Invasive papillary carcinomas of the breast are rare, accounting for less than 1-2% of invasive breast cancers. In most cases, these types of tumors are diagnosed in older women who have already been through menopause.

**IDC Type: Cribriform Carcinoma of the Breast**
In invasive cribriform carcinoma, the cancer cells invade the stroma (connective tissues of the breast) in nest like formations between the ducts and lobules. Within the tumor, there are distinctive holes in between the cancer cells, making it look something like Swiss cheese. Invasive cribriform carcinoma is usually low grade, meaning that its cells look and behave somewhat like normal, healthy breast cells. In about 5-6% of invasive breast cancers, some portion of the tumor can be considered cribriform. Usually, some ductal carcinoma in situ (DCIS) of the cribriform type is present as well.

**Lobular Carcinoma**
**Lobular** means that the abnormal cells start growing in the lobules, the milk-producing glands at the end of breast ducts. **Carcinoma** refers to any cancer that begins in the skin or other tissues that cover internal organs — such as breast tissue.

Breast profile: A ducts, B lobules, C dilated section of duct to hold milk, D nipple, E fat, F pectoralis major muscle, G chest wall/rib cage

Enlargement: A normal lobular cells B lobular cancer cells C basement membrane
**Lobular carcinoma in situ (LCIS): In situ or “in its original place”**

The term lobular carcinoma *in situ* (LCIS) is misleading. This lesion is more appropriately termed lobular neoplasia (A neoplasia is a collection of abnormal cells.). Strictly speaking, it is not known to be a premalignant lesion, but rather a marker that identifies women at an increased risk for subsequent development of invasive breast cancer. People diagnosed with LCIS tend to have more than one lobule affected. This risk remains elevated even beyond 2 decades, and most of the subsequent cancers are ductal rather than lobular.

**Features:**
- Frequently bilateral.
- Usually diagnosed before menopause, most often between the ages of 40 and 50. Less than 10% of women diagnosed with LCIS have already gone through menopause.
- LCIS is extremely uncommon in men.

**Invasive lobular carcinoma (ILC):** Breast cancer that begins in the milk-producing lobule cells, but then invades deeper into the breast, carrying the potential of spreading to the rest of the body (metastasizing). Invasive lobular carcinoma (ILC), sometimes called infiltrating lobular carcinoma.

**Features:**
- Second most common type of breast cancer after invasive ductal carcinoma (cancer that begins in the milk-carrying ducts and spreads beyond it). About 10% of all invasive breast cancers are invasive lobular carcinomas. (About 80% are invasive ductal carcinomas.) Although invasive lobular carcinoma can affect women at any age, it is more common as women grow older. About two-thirds of women are 55 or older when they are diagnosed with an invasive breast cancer. ILC tends to occur later in life (early 60s as opposed to the mid- to late 50s).
**Other rare conditions of Breast:**

**Paget's Disease of the Nipple**

Paget's disease of the nipple is a rare form of breast cancer in which cancer cells collect in or around the nipple. The cancer usually affects the ducts of the nipple first (small milk-carrying tubes), then spreads to the nipple surface and the areola (the dark circle of skin around the nipple). The nipple and areola often become scaly, red, itchy, and irritated. Paget's disease of the nipple accounts for less than 5% of all breast cancer cases in the United States. Being aware of the symptoms is important, given that more than 97% of people with Paget's disease also have cancer, either DCIS or invasive cancer, somewhere else in the breast. The unusual changes in the nipple and areola are often the first indication that breast cancer is present. Doctors are not yet completely sure how Paget's disease develops. One possibility is that the cancer cells start growing inside the milk ducts within the breast and then make their way out to the nipple surface.

**Features:**

Paget's disease of the nipple is more common in women, but like other forms of breast cancer, it can also affect men. The disease usually develops after age 50. According to the National Cancer Institute, the average age of diagnosis in women is 62, and in men, 69.

**Inflammatory Breast Cancer**

Inflammatory breast cancer (IBC) is a rare and aggressive form of breast cancer. It usually starts with the reddening and swelling of the breast instead of a distinct lump. IBC tends to grow and spread quickly, with symptoms worsening within days or even hours. According to the National Cancer Institute, about 1-5% of all breast cancer cases in the United States are inflammatory breast cancers. A 2008 study found that being overweight makes a person more likely to develop IBC. The average age at diagnosis for inflammatory breast cancer in the United States is 57 for white women and 52 for African American women. These ages are about 5 years younger than the average ages at diagnosis for other forms of breast cancer. According to the American
Cancer Society, inflammatory breast cancer is more common in African American women. Like other forms of breast cancer, IBC can also affect men.

**Phyllodes Tumors of the Breast**
Phyllodes tumors of the breast are rare, accounting for less than 1% of all breast tumors. The name "phyllodes," which is taken from the Greek language and means "leaflike," refers to that fact that the tumor cells grow in a leaflike pattern. Other names for these tumors are phylloides tumor and cystosarcoma phyllodes. Although most phyllodes tumors are benign (not cancerous), some are malignant (cancerous) and some are borderline (in between noncancerous and cancerous). All three kinds of phyllodes tumors tend to grow quickly, and they require surgery to reduce the risk of a phyllodes tumor coming back in the breast (local recurrence).

**Features:**
Phyllodes tumors tend to grow quickly, but they rarely spread outside the breast. Phyllodes tumors can occur at any age, but they tend to develop when a woman is in her 40s. Benign phyllodes tumors are usually diagnosed at a younger age than malignant phyllodes tumors. Phyllodes tumors are extremely rare in men.

**Breast Tests**

- **Physical Exam:** By examining the breast and nearby underarm tissue for lumps, skin changes, nipple discharge, or lymph nodes, a doctor can find any abnormalities in the breast. Characteristics of breast lumps, such as size, shape, texture, are usually noted.

**Screening**

- **Mammogram:** A mammogram is an x-ray picture of tissues inside the breast. Mammograms can often show a breast lump before it can be felt. They also can show a cluster of tiny specks of calcium. These specks are called microcalcifications. Lumps or specks can be from cancer, precancerous cells, or other conditions. Further tests are needed to find out if abnormal cells are present. Screening mammograms are performed to detect early changes in the breast before the occurrence of clinical
symptoms. Diagnostic mammograms may focus on a specific area of the breast. They may involve special techniques and more views than screening mammograms.

**Breast ultrasound:** Breast ultrasound can often determine whether a lump is made of fluid (cyst) or solid material.

**Breast magnetic resonance imaging (MRI scan):** Breast MRIs can add additional information to mammograms and are recommended only in specific cases.

- **Biopsy:** This is a procedure to confirm diagnosis of Cancer. A small sample of tissue is taken from an abnormal-appearing area of the breast that is seen on physical exam, mammogram, or other imaging study and examined for cancer cells. A biopsy may be done with a needle or with minor surgery.

- **Fine needle aspiration (FNA) breast biopsy:** A thin needle is inserted into an abnormal-appearing area of the breast and (aspirate) fluid and breast tissue is drawn out. This is the simplest type of biopsy and is mostly used for lumps that can be easily felt in the breast.

- **Core needle breast biopsy:** A larger, hollow needle is inserted into a breast mass, and a tube-shaped piece of breast tissue (core) is drawn out. A core biopsy provides more breast tissue for evaluation than an FNA biopsy.

- **Stereotactic breast biopsy:** A surgical procedure that uses mammography to collect a tissue sample from a breast lump. Stereotactic breast biopsies use the X-rays from mammograms to locate problems within the breast. This form of breast biopsy—called stereotactic—is often used when small growths or accumulations of calcium are detected on a mammogram, but do not appear on an ultrasound.

- **Surgical biopsy:** Surgery may be recommended to take out part or all of a breast lump to check for cancer.

- **Sentinel node biopsy:** A type of biopsy in which the health care provider locates and removes the lymph node(s) that the primary tumor is most likely to spread. This type of biopsy helps determine the likelihood that a cancer has spread.

**Lab Tests with Breast Tissue -**

If breast cancer is diagnosed, special lab tests on the breast tissue that was removed:
Hormone receptor tests: Some breast tumors need hormones to grow. These tumors have receptors for the hormones estrogen, progesterone, or both. If the hormone receptor tests show that the breast tumor has these receptors, then hormone therapy is most often recommended as a treatment option. See the Hormone Therapy section.

HER2/neu test: HER2/neu protein is found on some types of cancer cells. This test shows whether the tissue either has too much HER2/neu protein or too many copies of its gene. If the breast tumor has too much HER2/neu, then targeted therapy may be a treatment option.

Treatment for Breast Cancer

1. Surgery:
Most women with breast cancer have some type of surgery. Surgery is often needed to remove a breast tumor. The options include Breast-conserving surgery (partial or segmental mastectomy) or Entire Breast Removal (Mastectomy) whereby all of the breast tissue is removed, sometimes along with other nearby tissues. Lymph nodes are also excised during the surgery (to determine if the breast cancer has spread to axillary lymph nodes, one or more of these lymph nodes may be removed). Other options include preventive surgeries such as prophylactic mastectomy for women at high-risk and prophylactic ovary removal to lower estrogen production in the body. Reconstructive surgery can be done to restore the breast's appearance after surgery. This surgery can be done at the same time as the mastectomy (immediate reconstruction) or at a later time (delayed reconstruction).

2. Radiation: Radiation therapy can be given in 2 main ways.

External beam radiation
This is the most common type of radiation therapy for women with breast cancer. The radiation is focused from a machine outside the body on the area affected by the cancer. The extent of radiation depends on whether mastectomy or breast-conserving surgery (BCS) was done and whether or not lymph nodes are involved. If mastectomy was done and no lymph nodes had cancer, radiation is targeted at the chest wall and the places where any drains exited the body. If BCS was done, most often the entire
breast gets radiation, and an extra boost of radiation is given to the area in the breast where the cancer was removed to prevent it from coming back in that area. The boost is often given after the treatments to whole breast end.

**Internal Radiation (Brachytherapy)**

Instead of aiming radiation beams from outside the body, radioactive seeds or pellets are placed into the breast tissue next to the cancer. It is often used in patients who had BCS as a way to add an extra boost of radiation to the tumor site (along with external radiation to the whole breast). It may also be used by itself (instead of radiation to the whole breast). Tumor size, location, and other factors may limit who can get brachytherapy.

3. **Chemotherapy:**

Chemotherapy is the use of anti-cancer (cytotoxic) drugs to treat cancer. It is usually a systemic therapy\(^7\) that circulates throughout the body and destroys cancer cells, including those that may have broken away from the primary tumour.

- It may be used in following conditions:
- After surgery to destroy cancer cells left behind and to reduce the risk of the cancer recurring (adjuvant chemotherapy)
- Before surgery to shrink a large breast tumour (neoadjuvant chemotherapy).
- To treat a breast cancer recurrence
- To relieve pain or to control the symptoms of advanced breast cancer (palliative chemotherapy)

4. **Hormonal therapy**

Hormonal therapy is a systemic therapy that slows the growth and spread of breast cancer cells by changing hormone levels in the body, or by stopping breast cancer cells from using estrogen. Estrogen and progesterone are 2 female hormones made mainly by a woman’s ovaries until menopause. After menopause, the ovaries stop making estrogen, but the body continues to make a small amount of estrogen with an enzyme called aromatase. Estrogen and progesterone can stimulate the growth of some breast cancers. Hormonal therapy is used only in women who have breast cancer that
is estrogen receptor positive (ER positive or ER+) and progesterone receptor positive (PR positive or PR+). Hormonal therapy is not used in women who have hormone receptor–negative tumours.

Hormonal therapy may be used:

- After surgery and radiation therapy to stop cancer cells that may have been left behind from growing and to reduce the risk of the cancer recurring (adjuvant hormonal therapy)
- Before surgery, to shrink the primary tumour, especially in older women with breast cancer that is ER+, PR+ or both
- As part of a combined treatment approach for locally advanced breast cancer
- To decrease the chance of cancer developing in the opposite breast
- To treat breast cancer that has recurred
- To relieve pain or to control the symptoms of metastatic breast cancer (palliative therapy)

The following are the most common hormonal therapies used to treat breast cancer:

**Anti-estrogens:** Work by stopping breast cancer cells from getting estrogen. Anti-estrogens bind directly to and block the estrogen receptors. E.g Tamoxifen

**Aromatase inhibitors:** Aromatase is an enzyme involved in the production of estrogen in the body. Aromatase inhibitors are drugs that stop the production or block the actions of aromatase, which in turn lowers the level of estrogen in the body. E.g letrozole (Femara), anastrozole (Arimidex)

**Ovarian ablation:** Ovarian ablation (or ovarian suppression) refers to treatments that stop the ovaries from making estrogen. Reducing the level of estrogen made in the body helps prevent and stop breast cancer cells from growing. Ovarian ablation can be done in one of 3 ways: surgery, drugs (luteinizing hormone–releasing hormone agonists) or radiation therapy.
TNM Staging\textsuperscript{73}

TNM staging takes into account the size of the tumour (T), whether the cancer has spread to the lymph glands (lymph nodes) (N), and whether the tumour has spread anywhere else in the body (M – for metastases).

TNM results together to give you your overall stage.

Table 2. TNM Staging

**Fig.9  The T stages (tumour)**

<table>
<thead>
<tr>
<th>TX means that the tumour size cannot be assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tis</strong> means DCIS</td>
</tr>
<tr>
<td><strong>T1</strong> – The tumour is 2 centimetres (cm) across or less</td>
</tr>
<tr>
<td>T1 is further divided into 4 groups</td>
</tr>
<tr>
<td>T1mi – the tumour is 0.1 cm across or less</td>
</tr>
<tr>
<td>T1a – the tumour is more than 0.1 cm but not more than 0.5 cm</td>
</tr>
<tr>
<td>T1b – the tumour is more than 0.5 cm but not more than 1 cm</td>
</tr>
<tr>
<td>T1c – the tumour is more than 1 cm but not more than 2 cm</td>
</tr>
<tr>
<td><strong>T2</strong> – The tumour is more than 2 centimetres, but no more than 5 cms across</td>
</tr>
<tr>
<td><strong>T3</strong> – The tumour is bigger than 5 centimetres across</td>
</tr>
</tbody>
</table>
**T4** is divided into 4 groups

- **T4a** – The tumour has spread into the chest wall
- **T4b** – The tumour has spread into the skin and the breast may be swollen
- **T4c** – The tumour has spread to both the skin and the chest wall
- **T4d** – Inflammatory carcinoma – this is a cancer in which the overlying skin is red, swollen and painful to the touch

![Fig.10 The N stages (nodes)]

<table>
<thead>
<tr>
<th>N stages (nodes)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NX</strong></td>
<td>the lymph nodes cannot be assessed (for example, if they were previously removed)</td>
</tr>
<tr>
<td><strong>N0</strong></td>
<td>No cancer cells found in any nearby nodes</td>
</tr>
<tr>
<td><strong>N1</strong></td>
<td>Cancer cells are in the upper levels of lymph nodes in the armpit but the nodes are not stuck to surrounding tissue</td>
</tr>
<tr>
<td><strong>pN1mi</strong></td>
<td>One or more lymph nodes contain areas of cancer cells called micrometastases that are larger than 0.2mm or contain more than 200 cancer cells but are less than 2mm</td>
</tr>
</tbody>
</table>
| **N2**          | divided into 2 groups
- **N2a** – there are cancer cells in the lymph nodes in the armpit, which are stuck to each other and to other structures
- **N2b** – there are cancer cells in the lymph nodes behind the breast bone |
(the internal mammary nodes), which have either been seen on a scan or felt by the doctor. There is no evidence of cancer in lymph nodes in the armpit
divided into 3 groups
N3a – there are cancer cells in lymph nodes below the collarbone
N3b – there are cancer cells in lymph nodes in the armpit and behind the breast bone
N3c – there are cancer cells in lymph nodes above the collarbone

**Isolated tumour cells (ITCs)** are small clusters of cancer cells less than 0.2 mm across, or a single tumour cell, or a cluster of fewer than 200 cells in one area of a lymph node. Lymph nodes containing only isolated tumour cells are not counted as positive lymph nodes

**Fig.11 The M stages (metastases)**

<table>
<thead>
<tr>
<th>M0</th>
<th>There is no sign of cancer spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>cMo(i+)</td>
<td>There is no sign of the cancer on physical examination, scans or X-rays but cancer cells are present in blood, bone marrow, or lymph nodes far away from the breast cancer – the cells are found by laboratory tests</td>
</tr>
</tbody>
</table>
Cancer has spread to another part of the body

**Grade (The Bloom–Richardson grading system):**

The grading of a cancer in the breast depends on the microscopic similarity of breast cancer cells to normal breast tissue, and classifies the cancer as well differentiated (low grade), moderately differentiated (intermediate grade), and poorly differentiated (high grade), reflecting progressively less normal appearing cells that have a worsening prognosis. Although grading is fundamentally based on how biopsied, cultured cells behave, in practice the grading of a given cancer is derived by assessing the cellular appearance of the tumor. The closer the appearance of the cancer cells to normal cells, the slower their growth and the better the prognosis. If cells are not well differentiated, they will appear immature, will divide more rapidly, and will tend to spread. Well differentiated is given a grade of 1, moderate is grade 2, while poor or undifferentiated is given a higher grade of 3 or 4 (depending upon the scale used).

The Nottingham (also called Elston-Ellis) modification of the Scarff-Bloom-Richardson grading system is recommended, which grades breast carcinomas by adding up scores for tubule formation, nuclear pleomorphism, and mitotic count, each of which is given 1 to 3 points. The scores for each of these three criteria and then added together to give an overall final score and corresponding grade as follows.
The grading criteria are as follows:

**A. Tubule formation -**
This parameter assesses what percent of the tumor forms normal duct structures.
1 point: tubular formation in more than 75% of the tumor
2 points: tubular formation in 10 to 75% of the tumor
3 points: tubular formation in less than 10% of the tumor

**B. Nuclear pleomorphism -**
This parameter assesses whether the cell nuclei are uniform like those in normal breast duct epithelial cells, or whether they are larger, darker, or irregular (pleomorphic).
1 point: nuclei with minimal variation in size and shape
2 points: nuclei with moderate variation in size and shape
3 points: nuclei with marked variation in size and shape

**C. Mitotic count -**
This parameter assesses how many mitotic figures (dividing cells) the pathologist sees in 10 microscope fields. One of the hallmarks of cancer is that cells divide uncontrollably. The more cells that are dividing, the worse the cancer.

1 **point:** 0-9 mitotic counts per 10 fields under X25 objective using the Leitz Ortholux microscope, 0-5 mitotic counts per 10 fields under X40 objective using the Nikon Labophot microscope, or 0-11 mitotic counts per 10 fields under X40 objective using the Leitz Daiplan microscope

2 **points:** 10-19 mitotic counts per 10 fields under X25 objective using the Leitz Ortholux microscope, 6-10 mitotic counts per 10 fields under X40 objective using the Nikon Labophot microscope, or 12-22 mitotic counts per 10 fields under X40 objective using the Leitz Daiplan microscope

3 **points:** Over 19 mitotic counts per 10 fields under X25 objective using the Leitz Ortholux microscope, over 10 mitotic counts per 10 fields under X40 objective using
the Nikon Labophot microscope, or over 22 mitotic counts per 10 fields under X40 objective using the Leitz Daiplan microscope.

D. **Overall grade** -

The scores for each of these three criteria are added together to give a final overall score and a corresponding grade as follows:

- 3-5 **Grade 1** tumor (*well-differentiated*). Best prognosis.
- 6-7 **Grade 2** tumor (*moderately-differentiated*). Medium prognosis.
- 8-9 **Grade 3** tumor (*poorly-differentiated*). Worst prognosis.

Lower grade tumors, with a more favorable prognosis, can be treated less aggressively, and have a better survival rate. Higher grade tumors are treated more aggressively, and their intrinsically worse survival rate may warrant the adverse effects of more aggressive medications.
Aahar

Definition of Aahar
What can be eaten is called ‘Aahar’. Aahar is the cause of life. It is also responsible for bala(strength), varna(glow) and ooja(vitality).

Aahar Prashasti (Importance of Aahar)
In Taittiriya Upanishad importance of food and its relation to man has been described thus: From this Atmana has sprung Aakash, From Aakash - Vayu, From Vayu - Agni, from Agni-Aapa(water), from Aapa-Prithivi. From Prithivi - oshadhi (vegetation). From vegetation - foods. From food man exists. Thus man is constituted of the essence of food.

Aahar is excellent means for maintenance of life.

Aahar is the cause of creation, sustenance and destruction for humans and gods alike. Due to aahar, growth of body and mind, physical and mental strength, health, glow of the skin and proper functioning of the indriyas (special senses) is attained. Due to imbalance in the aahar diseases are caused. In short, everything is dependent on aahar.

Aahar is mentioned as one of the Traya Upastambha (Three subordinate pillars).

Acharyas referring the body as abode of atma describe the functioning of the body. Body comprises of three main elements viz. Vata, Pitta, Kapha. These three when in equilibrium maintain the body functions of the lower, middle and upper body respectively just as the pillars of the house hold it together or support the structure. Hence many learned acharyas call the body as ‘Tristhuna’. When these doshas are vitiated they cause destruction of the body.
Aahariya Nidan of Arbuda – (Dietary factors in causation of Arbud)

Factors responsible in Pathogenesis of Arbud

Dosha – Vata, Pitta, Kapha

Dushya – Rasa-Rakta \(^5^0\), Mansa \(^5^1\), Meda \(^5^2\)

Agni – Dhatvagni dushti

Srotasa – Rasavaha, Raktavaha, Mansavaha srotasa \(^5^3\), Medovaha

Marg – Bahya roga marg\(^5^4\)

Sthana – Anywhere in the body.

Considering these factors it can be summarised that aahar which causes aggravation of the three doshas and vitiation of Rasa, Rakta, Mansa & Meda are risk factors for causing arbud. Stana is the abode of Stanya. Stanya is mentioned as upadhatu of Rasa hence, aahar which causes dushti of stanya or Stana is also responsible in pathogenesis of Stanarbud.

Samanya Dosha prakopak Aahar in causation of Diseases \(^8^0, 8^1\):

Table 3. Doshaprakopak Aahar

According to Guna:

<table>
<thead>
<tr>
<th>Vataprapokap</th>
<th>Pitta prakopak</th>
<th>Kaphaprakopak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rasa</td>
<td>Tikta-Katu-Kashaya</td>
<td>Katu-Amla-Lavana</td>
</tr>
<tr>
<td>Veerya</td>
<td>Sheeta</td>
<td>Ushna</td>
</tr>
<tr>
<td>Guna</td>
<td>Laghu,Ruksha</td>
<td>Tikshna,Laghu</td>
</tr>
<tr>
<td>Karma</td>
<td>Vishtambhi</td>
<td>Vidahi</td>
</tr>
</tbody>
</table>

According to Dravya:

<table>
<thead>
<tr>
<th>Vataprapokap</th>
<th>Pitta prakopak</th>
<th>Kaphaprakopak</th>
<th>Sarvadoshaprapokap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shuka</td>
<td>Truna dhany Varak</td>
<td>Navanna,Godhum</td>
<td></td>
</tr>
<tr>
<td>Shimbi</td>
<td>Kalaya,Chanak, Mudga, Masur, Aadhaki, Nishpava</td>
<td>Navanna,Masha</td>
<td></td>
</tr>
</tbody>
</table>

\(^5^0\) Rasa-Rakta
\(^5^1\) Mansa
\(^5^2\) Meda
\(^5^3\) Mansavaha srotasa
\(^5^4\) Bahya roga marg
80, 81:
<table>
<thead>
<tr>
<th>Vataprapakopak</th>
<th>Pitta prakopak</th>
<th>Kaphaprapakopak</th>
<th>Sarvadoshapatikopak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viruddhaka</td>
<td>Godha, Matsya, Aja, Avik</td>
<td>Anup Mansa, Jaliya Mansa, Vasa</td>
<td>Shushka Mansa</td>
</tr>
<tr>
<td>Mansa</td>
<td>Shushka Mansa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaka</td>
<td>Bisa, Shaluka Shushka Shaka</td>
<td></td>
<td>Aama Mulak, Sarshapa, Shusha Shaka,</td>
</tr>
<tr>
<td>Phala</td>
<td>Jambu, Tinduk Karir, Tumba, Kalinga, Chirbhit</td>
<td>Pilu, Bhallaka, Ray Amrataka, Amlika, Maricha, Amla Phala</td>
<td>Lakucha, Aama Phala</td>
</tr>
<tr>
<td>Haritaka</td>
<td>Harita Shaka</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madya</td>
<td>Shukta – Sandaki madya, Sauviraka, Sura</td>
<td>Dushit Madya, yava sura</td>
<td></td>
</tr>
<tr>
<td>Jala</td>
<td>Ati jala prashana</td>
<td>Dushit jala</td>
<td></td>
</tr>
<tr>
<td>Gorasa</td>
<td>Mastu, Dadhi, Takra, Kurchika, Mastu</td>
<td>Aama Kshira, Kilata, Morata, Kurchika, Takra, Piyush, Dadhi, Dugdha</td>
<td>Mandak Dadhi</td>
</tr>
<tr>
<td>Ikshu</td>
<td></td>
<td>Ikshuras, Phanita, Guda</td>
<td></td>
</tr>
<tr>
<td>Krutanna</td>
<td>Dhanyamla, Pinyaka, Atyamla Kanjika (Katvara)</td>
<td>?Pindaka Pruthuka, Sthula anna, Bhakshya, Shashkuli (Kachori), Krushara, Kheer</td>
<td>Pinyaka</td>
</tr>
<tr>
<td>Aaharopayogis</td>
<td>Taila, Tila taila</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to Ashana Padhati

<table>
<thead>
<tr>
<th>Ashana Paddhati</th>
<th>Vataprakopak</th>
<th>Pittaprakopak</th>
<th>Kapha Prokopak</th>
<th>Sarvadoshaprakopak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashana Vichara</td>
<td>Heena Bhojana</td>
<td>Samashana Adhyashana</td>
<td>Anashana</td>
<td>Ati Bhojana</td>
</tr>
<tr>
<td>Pramita Bhojana</td>
<td></td>
<td></td>
<td>Adhyashana</td>
<td>Samashana</td>
</tr>
<tr>
<td>Trushnasamayi Bhojana</td>
<td></td>
<td></td>
<td>Vishamashana</td>
<td>Viruddhşhana</td>
</tr>
<tr>
<td>Upavasa Vishamashana</td>
<td></td>
<td></td>
<td>Sankirna Bhojana</td>
<td>Anna parivartana</td>
</tr>
</tbody>
</table>

Since Arbud is caused due to vitiation of Rakta, Mansa, Meda dhatu, aahar which is responsible for vitiation of its srotasas is also important.

**Table 4. Raktadushatikara Aahar**

<table>
<thead>
<tr>
<th>Rasa</th>
<th>Amla (sour), Lavan (salt), Katu rasa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guna</td>
<td>Drava, Snigdha, Guru</td>
</tr>
<tr>
<td>Shimbi</td>
<td>Kulattha, Masha, Nishpava, Pindalu, Mulak</td>
</tr>
<tr>
<td>Mansa</td>
<td>Jalaj, Anup mansa</td>
</tr>
<tr>
<td>Haritaka</td>
<td>Ardrak, Jambir, Surasa, Ajmoda, Shigru, Rajika, Dhanyak, Grunjanaka</td>
</tr>
<tr>
<td>Jala</td>
<td>Atijala sevan</td>
</tr>
<tr>
<td>Gorasa</td>
<td>Dadhi, dadhi Mastu</td>
</tr>
<tr>
<td>Aaharopayogi</td>
<td>Kshara</td>
</tr>
<tr>
<td>Ashana Vichar</td>
<td>Viruddhashana, durgandhita Aahar, Atyashana, Ajeerna, Adhyashana</td>
</tr>
</tbody>
</table>

- **Rasavaha Srotasa**
  - Guru aahar (food which is heavy to digest)
  - Sheeta aahar (Cold food - in potency & Thermally)
• Ati snigdha (Fatty diet, food having excessive amount of fats)
• Atyashana (overeating)
• Samashana (Having wholesome and unwholesome food together)

- **Raktavaha Srotasa**
  - Vidahi Aahar (Food which causes irritation to the mucosa/causes burning sensation)
  - Snigdha aahar (Fatty diet, food having excessive amount of fats)
  - Drava Aahar (Excessive intake of Liquids)

- **Mansavaha Srotasa**
  - Abhisyandi Aahar (channel blocking food / food causes blockage in the channels)
  - Sthula Aahar (Bulky diet e.g- Laddoo)
  - Guru aahar (food which is heavy to digest)

- **Medovaha Srotasa**
  - Medya Aahar (Fatty foods, oily food)
  - Varuni Atisevan (Excessive intake of Alcohol)

**Characteristics of Arbud –**
Arbud bears resemblance with granthi and shotha. Arbud is bigger than granthi. Has the predominance of kapha dosha and meda dhatu, is sthira (fixed/hard) hence does not suppurate. Charakacharya mentions arbud similarity with shotha with respect to elevation.

**Aahariya Nidan of Arbuda – (Specific dietary factors in causation of Arbud)**
The causation of mansaja granthi is specified as excessive use of mansavardhak aahar (consumption of meat). Medoja granthi is caused by excessive intake of medovardhak aahar (fatty food).
Dietary causes of Shotha are mentioned as follows

### Aahar Hetu for Shotha

Excessive intake of following:

- **Rasa**
  - Amla (sour), Lavan (salt)
- **Guna**
  - Guru, Snigdha, Sheeta, Teekshna, Ushna
- **Shuka**
  - Navanna
- **Shimbi**
  - Viruddhaka
- **Mansa**
  - Gramya Mansa, Shushka Mansa
- **Shaka**
  - Amla shaka
- **Phala**
  - Amla Phala
- **Haritaka**
  - Ardrak, Jambir, Surasa, Ajmoda, Shigru, Rajika, Dhanyak, Grunjanaka
- **Jala**
  - Jala
- **Gorasa**
  - Dadhi, Mandak
- **Krutanna**
  - Pishtanna, Raga
- **Aaharopayogi**
  - Kshara

### Dietary Causes in Vitiation of Stanya

- **Rasa**
  - Lavan (salt), Katu (Hot and Spicy)
- **Karma**
  - Abhishyandi
- **Shuka**
  - Navanna
- **Shimbi**
  - Viruddhaka
- **Mansa**
  - Mansa sevan
- **Haritaka**
  - Ardrak, Jambir, Surasa, Ajmoda, Shigru, Rajika, Dhanyak, Grunjanaka
- **Madya**
  - Madya sevan
- **Gorasa**
  - Dadhi, Mandak
- **Ikshu**
  - Gur (Jaggery)
- **Krutanna**
  - Paramanna, Sweets prepared in oil or ghee
- **Aaharopayogi**
  - Kshara
- **Ashana**
  - Praklinna Bhojan
Prakara

Asatmya Bhojan
Vishamashana
Viruddhashana
Atyashana

Literature Review of the Causative Factors:

Rasataha

Amla Ras –Atiyog

93, 94, 95

Mahabhuta Prithvi + Agni
Guna- Karma Laghu , Snigdha ,Ushna, Vyavayi
Action on Doshas Kapha vilayana , Pitta vardhak
Action on Dhatu Hrudya(apppeasing to the Heart), Rakta dushaka(vitiates Blood),
Mansa vidahana(causes irritation in muscular tissue), Dhatu
Shaithilya(causes flaccidity)
Action on Malas Danta harsha (Sensitive Teeth),Looma sanvejana(Causes
goosebumps), Akshisamimilana(causes involuntary blinking of the eyes)
Causation in Vrana Bheda( bursting open of wounds),Trushna( excessive
Diseases thirst), Vrana paka(suppuration of wounds),Kantha-Urah daha
( Burning sensation in throat and chest region).
Kandu( Itching), Anaemia, Visarpa, Rakta-pitta,
Shotha(swelling), Bhrama (vertigo)

Lavan Rasa Atiyog

96, 97, 98

Mahabhuta Jala + Agni
Guna –Karma Not too heavy, Vyavayi,Vikashi, Sara,Snigdha,
Tikshna, Ushna, Sarvarasa nashak
Action on Doshas Pitta prakop(aggrevation of pitta dosha),
Action on Indriyas Indriya uparodha( reduced functioning of senses)
Action on Dhatu Raktavruddhi(increase in rakta dhatu), Mansa kotha
(decomposition of mansa), Decrease in shukra (semen)
Balakshaya (Reduced strength), Oojanasha (reduction in vitality)

**Action on Malas**
Danta harsha (Sensitive Teeth)

**Causation in Diseases**
Trushna (excessive thirst), Tapavruddhi (Increase in body temperature), Kushtha (skin disorders), Vali (wrinkles), Palita (Premature ageing), Visha (increases toxins), Vranabheda (Bursting open of wounds) (ch) Murccha (fainting), Shotha (oedema), Alopecia, Rakta-pitta, Amlapitta, Visarpa, Vata-rakta, Vicharchika (skin disorders), Indralupta (ch), Kotha (urticaria) (su), Gatrakandu (itching), skin discoloration, Mukhapaka (stomatitis), Akshipaka (suppuration at the eye), Kitibha, Akshepa (convulsion), Mada, Kshata (causes lacerations) (vagbhat)

**Katu rasa – Atiyog**

<table>
<thead>
<tr>
<th>Mahabhuta</th>
<th>Vayu+ Agni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guna – Karma</td>
<td>Laghu, Ushna, Teekshna, Ruksha</td>
</tr>
<tr>
<td>Action on Doshas</td>
<td>Vata vardhak, Pitta vardhak</td>
</tr>
<tr>
<td>Action on Indriyas</td>
<td>Saada (listlessness), Glani (dizziness), Tama (daze)</td>
</tr>
<tr>
<td>Action on Dhatus</td>
<td>Bhrama (vertigo), Talu shosha (dryness of the palate region), Jihva shosha (dryness of the lips) (su)</td>
</tr>
<tr>
<td>Causation in Diseases</td>
<td>Shukranaasha (azoospermia), Karshana (reduces dhatus)</td>
</tr>
</tbody>
</table>

**Gunataha:**

**Aahar with respect to Guna**

Of the 20 gunas mentioned the following gunas have dominance in aggravation of doshas.
Sheeta guna – Increases Kapha & Vata dosha and alleviates Pitta dosha. It is Prahladana (appeasing to the mind), Vishyandana (restricts the flow of fluids), Sthirikarana (gives steadiness to the body), Prasdana (pacifies Rakta and Pitta dosha), Kledana (keeps the body cells moist), Jeevan (imparts life), Stambhana, Guru, Balya (gives strength).

Ushna Guna - Alleviates Kapha and Vata, Aggravates Pitta dosha. Dahana (cause irritation), Pachana (speed up reactions like suppuration), Murchana (lack of consciousness), swedana (causes sweat), Vamana, Virechana (increases bowel peristalsis), vilayana (causes liquefication), causes Bhrama (dizziness), Trushna (excessive thirst).

Laghu guna – Increases Vata Dosha. Of the six rasa, Tikta rasa is the most laghu rasa. Though it creates lightness in the body, excessive intake of these dravyas can cause reduction in the dhatus, emaciation, lack of strength.

Guru guna – Increases Kapha dosha. Guru guna is necessary for strengthening and nourishment. But in excess it can cause inertness, heaviness, Lack of appetite, obesity etc.

Tikshna guna - Pitta dosha. Teekshna guna has a piercing action. It is necessary for penetration. But in excess it causes irritation to the tissues. It can deepen the wounds. It makes a person thin.

Snigdha guna – Increases Kapha dosha. This guna is necessary for the softness of srotasas for smooth functioning. But in excess it can cause flaccidity in the dhatus and hamper their functioning. It is responsible for causing obesity.

Picchila Guna – Increases Kapha dosha. It increases the dhatus, has the quality of binding the elements. In excess it can increase the production of dhatus, can cause
obstruction in organs disrupting their functions or cause coating in the hollow organs like ateries.

**Drava Guna**\(^{109}\) – Increases Pitta dosha, Kapha dosha (increases secretions) and Rakta dhatu. It maintains moisture in the body elements.Increases the drava mala-i.e mutra and sweda and helps in their excretion. In excess this guna causes agnimandya, increases kaphasecretions thereby increases the flaccidity of dhatus.

Sheeta, Ushna,Laghu, Guru,Teekshna and Snigdha are mentioned as veerya by Charakacharya. Veerya means potency.These gunas possess power to exert there effect on the body.

**Vidahi**
Daha (burning sensation which is contrary or extremes causing irritation is termed as ‘vidaha’\(^{110}\).
Dravyas which cause amlodgar (sour belching) , daha(burning sensation), trushna(excessive thirst) , gets digested with difficulty and aggrevates pitta dosha are termed as ‘Vidahi’\(^{111}\), \(^{112}\).

Due to the characteristic of dravya and guru gunait gets digested slowly. It causes pitta prakop and daha(gastric irritation)\(^{113}\).

**Abhishyandi**
Abhishyandi dravyas cause ardrata(moisture), kleda(stickiness), and excessive secretions. It causes upalepa(coating ) . Due to abhshyandi dravyas srotasas get vitiated causing srotas dushti(vitiation of channels), increasing secretions and vitiated kapha dosha.e.g of abhishyandi dravya – Dadhi, matsya etc\(^{114}\), \(^{115}\), \(^{116}\), \(^{117}\).

**Dravyataha:**

**Navanna**\(^{118}\), \(^{119}\) –

**Guna** – **Karma**

– Madhur ,Guru, Snigdha ,Vishtambhi, Abhishyandi

**Action on Doshas**

– Vatashamak, Kaphavardhak
Pathya – Raktapitta
Grains which have been freshly cut and stored are abhisyandi.\textsuperscript{120} Yava(barley), godhum(wheat), Til(sesame seeds) and Masha(black gram) are exception to this rule. They are to be used freshly cut. Since if they are kept for a long time they lose their taste, become ruksha(dry) and lack nutrition.(Bh.Prakash)

**Viruddhaka**
Viruddhaka or sprouts create vidaha( irritation to the mucosa), are guru(heavy to digest), Vishtambha (cause flatulence) and are harmful for the eyes.\textsuperscript{121}

**Viruddhaka Bhakshya (Apathya Bahkshya made from sprouted beans)\textsuperscript{122}**

<table>
<thead>
<tr>
<th>Guna</th>
<th>– Guru, Vidahi, Ruksha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Doshas</td>
<td>– Vata vardhak, Pitta vardhak</td>
</tr>
<tr>
<td>Action on Dhatu</td>
<td>– Drushtipradushak(harmful for the eyes)</td>
</tr>
</tbody>
</table>

**Mansa –**

**Gramya Mansa\textsuperscript{123}**

<table>
<thead>
<tr>
<th>Guna-Karma</th>
<th>– Madhur, Deepana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Doshas</td>
<td>– Vata shamak, Pittavardhak, Kaphavardhak</td>
</tr>
<tr>
<td>Action on Dhatu</td>
<td>– Bruhan (nourishes the body), Bala(gives strength)</td>
</tr>
</tbody>
</table>

**Anup Mansa\textsuperscript{124,125}**
Anup Mansa is of five types.

**I. Kulachara -** which reside near the banks or shore.

<table>
<thead>
<tr>
<th>Guna</th>
<th>– Madhur, Sheeta, Madhur, Snigdha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Doshas</td>
<td>– Vatashamak, Pittashamak, Kaphavardhak</td>
</tr>
<tr>
<td>Action on Dhatu</td>
<td>– Balavardhak, Vrushya(increases semen)</td>
</tr>
<tr>
<td>Action on Malas</td>
<td>- Increases mutra (urine)</td>
</tr>
</tbody>
</table>

**Gavya\textsuperscript{126,127}**  

<table>
<thead>
<tr>
<th>Guna</th>
<th>– Madhur, Ushna, Madhur, Guru, Snigdha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action on Doshas</td>
<td>– Vata shamak, Pitta vardhak, Kapha vardhak</td>
</tr>
</tbody>
</table>
Action on Dhatus – Bruhan, Balya, and Vrushya (increases semen)
Pathya – Shushka kasa (dry cough), Atyagni (excessive hunger),
Fever, Peenanas (chronic sinusitis), Krusha (emaciated),
Shwasa (breathlessness), Arochaka (lack of taste)

**Mahisha**\(^{128,129}\)

Guna -Kashaya – Madhur, Ushna, Madhur, Snigdha, Guru
Action on Dhatus – Tarpak, Vrushya(increases semen), Stanyavardhak,
Balavardhak (increases strength), increases muscle power.

**Varaha**\(^{130,131}\)

Guna – Madhur, Ushna, Amla, Guru, Snigdha, Ushna
Action on Doshas – Vata shamak
Action on Dhatus – Tarpana, Balya, Bruhana, Shukravardhak
Action on Malas – Swedana

**II. Plava**\(^{132}\) - which swim in water

Guna – Madhur, Sheeta, Snigdha
Action on Dhatu – Vrushya (increases semen)
Action on Malas – Increases Mutra and purish (faeces)

**III. Koshatha** – which are found in shells

**IV. Padin**\(^{133}\) – which are in water and have legs

Guna – Madhur, Sheeta, Madhur, Snigdha
Action on Doshas – Vatashamak, Pittashamak, Kaphavardhak

**V. Matsya**\(^{134}\) – Fish

Guna – Madhur, Ushna, Madhur, Snigdha, Guru, slightly
Laghu(seawater fish)
Action on Doshas – Pitta vardhak, Sea water fish is Agnivardhak (increases appetite)
Action on Dhatu – Bruhan (nourishing), Balya (strengthening), Vrushya (increases semen)
Fish found in very salty sea is Drushtinashak (harmful for sight)
Action on Malas – sangrahi (creates constipation)

Anup varga mansa is described as Mahaabhishyandi 135.

Shushka Mansa 136, 137 –
Guna - Guru (heavy to digest).
Action on Doshas – Vatavardhak, Pittavardhak
Action on Dhatu – Creates Aruchi (lack of taste), Avrushya (decreases semen)
Apathya - Pratishyaya (cold)

Haritaka 138 –
Pippali, Maricha, Shunthi, Hingu, Jeerak, Dhanyak, Jambir (lime), Surasa (Tulsi), Bhustruna (Lemon grass), Sarshap (mustard seeds) Shigru (Drumsticks), Mulak (Raddish), Pandalu (Onion) are many times used as vegetable or for tempering.
Guna –Katu, Ushna, and Ruchya (enhances taste)
Action on Dosha – Vatashamak, Kaphashamak

Grunjanak
Guna-Karma - Teekshna
Action on Doshas – Vatashamak, Pittavardhak, Kaphashamak
Action on Malas – Swedajanak (induces sweat)
Pathya – Arsha

Jala Sevan Vidhi (Rules for intake of Water) 139
Before having water it should be analysed in these 5 ways - Kevala (in totality), Saaushadhi (with medicines), Pakva (boiled) & Ushna (warmth) and hitakara
Water thus analysed should be had in proper quantity. This way it acts like amrit (life-saving) or else it acts like visha (poison).

**Atijala sevan**

While having food water should be sipped in between the meals. Having too much water or not having it at all can hamper digestion. Too much water reduces the gastric fire and too little water can hamper digestion since the digestive juices are not produced in required quantities thus causing ajirna (indigestion).

**In Diseases**

Intake of jala should be restricted in Aroochi (lack of taste), Pratisyaya (cold), Praseka (excessive salivation), Swayathu (oedema), Kshaya, Mandagni (reduced appetite), Udara (Ascites), Kushtha (skin diseases), Jwara (fever), Netraroga (Eye disorders), Vrana (wounds) and Madhumeha (diabetes).

*Since jala is opposed to agni too much of water intake reduces the gastric fire.*

A person whose doshas are imbalanced, whose immunity is reduced due to disease should not drink water without boiling, since it can increase all the three doshas.

A person with reduced appetite should also not drink cold water. In diseases like Abhishyanda, Pleeha (spleenomegaly), Vidradhi (abscess), Gulma, Pandu (anaemia), Udara (ascites), Arsha (piles), Atisaara (diarrhea), Grahani (colitis), Shosha and Shopha (oedema) one should restrict water as far as possible but if need arises he should have medicated water. Even in health he should have less water except in Sharad rutu and Grishma rutu.

Water acts as a medicine in indigestion, if taken after the food gets digested it increases strength, if taken in-between acts like nectar and if taken immediately after having food it acts like poison.

**Dadhi**

**Properties**

- Guna - Madhur (Sweet) or Amla (sour) or extremely Amla (sour)
- Anurasa - is kashaya (astringent), Ushna, Amla, Snigdha (unctuous)
Action on Doshas – Kapha vardhak (madhur dadhi), Abhishyandi (madhur dadhi)
Action on Dhatus – increases Meda dhatu (madhur dadhi)
Pathya - Peenasa (sinusitis), Visham jwara (fever), Atisaar, arochaka (lack of taste), Mutrakrucchra (difficulty in micturition) and emaciated person.

Out of the three types madhur dadhi is very abhshyandi
Amla dadhi is aggrevates Kapha and Pitta while extremely Amla Dadhi vitiates Rakta dhatu.

MandakDadhi (Dadhi which is not well formed) is vidahi (irritates the body tissues / causes burning sensation, causes increase in the malas – Purish and Mutra and is tridosha prakopak (increases all the three doshas simultaneously) (su.su 45/66)

Mastu – The liquid/ watery part of Dadhi is guru (heavy to digest), Vrushya (increases semen), diminishes agni (gastric fire) and increases Kapha and shukra (semen).

Pishtaka (Fooditems made from rice flour)  
Guna – Ushna, Guru, Vidahi
Action on Doshas - Kaphavardhak, Pitta vardhak
Action on Dhatus – Does not give bala

Bhakshya prepared in Ghrut (clarified butter)  
Guna – Sugandhi, Laghu
Action on Doshas – Vatashamak, Pittashamak
Action on Dhatus – Hrudya, Varnaprasadak, Balya, Drushti prasadak

Bhakshya prepared in Taila(oil)  
Guna – Ushna, Katu, Vidahi, Guru
Action on Doshas – Vatashamak, Pitta vardhak
Action on Dhatus – Twak dushak, Drushti dushak

Raga (accompaniments like Chutni, sauces)  
Guna – Katu, Amla, Madhur, Lavan, Laghu
Action on Dhatus – Hrudya (appeasing to the heart), Balya (gives strength), and Vrushya (increases semen)

Pathya – Trushna (excessive thirst), Murccha (giddiness), Bhrama (vertigo), Chhardi (vomiting), Shrama (fatigue).

Effects – Imparts taste, Hrudya (beneficial for the heart, pleases the senses), Deepana (increases appetite),

Kshara \(^{151}\) -

Guna – Karma – Ushna, Teekshna, Laghu. Pachana (suppuration), Dahana (irritation), Bhedana (penetration). Initially causes kledana and then shoshana (Increases secretions in the body and later causes depletion).

Action on Dosha

-Dhatu-Malas – Harmful effects on Kesha (hair), Akshi (eyes), Hrudaya (heart), Shukra (reduces semen)

If used in excess it causes Andhya (blindness), Shandhya (infertility), Khalitya (alopecia) and Palitya (untimely greying of hair)

Aahar Hetu with respect to Aashana padhati

Definition \(^{152, 153}\)

Samashana - Mixing hitakaradravya and Ahitakaradravya together is defined as ‘Samashana’.

Vishamashana - 1. Eating very less or sometimes in excess (overeating)

2. Having food at irregular timings

Food if taken in excess or if taken in irregular quantity i.e sometimes less sometimes more and also if food is taken at irregular time it is termed as ‘Vishamashana’.

Vishamashana with respect to kala \(^{154,155}\) -

Having food at irregular timings - Avoid eating in Aprapta kala (when one is not hungry) or Ateetakala (after the sensation of hunger has subsided). If one eats in apraptakala he is liable to suffer from Ajeerna (indigestion), Visoochika or sometimes may meet death. Food eaten in ateetkala becomes difficult to digest since increased
vata dosha destroys the pachakagni (digestive fire). Thus the food does not get digested properly and the person does not have urge to eat.

- **Vishamashana with respect to Matra (quantity)**

Aahar Matra is defined as the quantity of food which does not impede in prakruti and which gets digested easily is termed as aahar matra for that particular individual. Matra according to the prakruti of dravya

Dividing stomach into three parts Guru dravya should be taken taken half the quantity, while laghu dravya should not be eaten too much.

Aahar matra is one of the important factors to be taken into consideration. A person should always eat food in proper quantity. This quantity is dependent on agni (gastric fire) and aahar dravya (food substance).

**Signs of Matravat Aahar (properties of food which is eaten in proportion)**

- Doesn’t exert pressure on the flanks
- Doesn’t put pressure on the heart
- Doesn’t cause heaviness in the abdomen
- Imparts smooth functioning of the senses
- Gives a feeling of satiety
- Does not impede activities like standing, sitting, walking, breathing, talking etc.
- Gets easily digested in four yama,
- Gives strength, improves complexion

Amatra or improper quantity is of two variations:

1. Heena Matra - Having food in less quantity than required for the body nourishment
2. Ati Matra - Having food in more quantity than required for the body nourishment
Ati Matra\textsuperscript{161, 162}

Food taken in excess quantity on the other hand causes aggravation of all the doshas. A person who fills his stomach with guru dravyas and then has liquids like milk upto his capacity creates imbalance in the tri-doshas. Due to overeating these doshas reside in a part of stomach and vitiate the food ingested. These aggravated doshas and vitiation of aahar causes symptoms according to the aggravation of doshas.

Symptoms caused due to aggravated Vata Dosha –
Shula(pain), Aanaha(Abdominal distention), Angamarda(Bodyache), Mukhshosha(Dryness of mouth), Murccha (syncpe), Bhrama(dizziness), Agnivaishamya (disturbance in digestion), Stiffness in the chest & back muscles, constriction in the sira (veins).

Symptoms due to aggravated Pitta Dosha – Jwara(fever), Atisaara(diarrhoea), Antardaha(irritation or burning sensation in the body), Trushna(Excessive thirst), Mada, Bhrama(vertigo), Pralapa(irrelevant talk)

Symptoms due to aggravated Kapha Dosha – Vaman (vomiting), Aroochaka (Lack of taste), Avipaka (indigestion), Sheeta jwara (fever with chills), Aalasya (laziness), Gatra gaurav (feeling of heaviness).

It creates obstruction in the channels and cause ‘Alasaka’. Sometimes these doshas cause vomiting or diarrhoea ‘Visoochika’.

Eating very less or sometimes in excess (overeating) is called as ‘Vishamashana’. Food if eaten in less quantity does not give a feeling of satiety, reduces strength, causes emaciation. Food eaten in excess causes alasya (lethargy), Gaurav (feeling of heaviness), Aatopa and agnimandya(lack of appetite)\textsuperscript{163, 164}.

Viruddhashana –
Any Dravya (food or medicine) which aggravates the doshas but do not eliminate them from the body is harmful to the body. These dravyas act against the functioning of the dhatus\textsuperscript{165, 166}

Any Dravya which is opposite to\textsuperscript{167}

Viruddhashana Prakar

1. Desha  Contradictory food with respect to Land
   Viruddha  E.g. Ruksha (dry) and Teekshna (penetrating) dravyas in jangal desha, snigdha (unctuous) and sheeta (cold) food in Anup desha.

2. Kala  Contradictory food with respect to Kala(time)
   Viruddha  E.g. Cold and Dry food in Cold weather
              Katu (Hot & Pungent food) in Hot weather
              Eating Sattu (roasted flour of Horsegram and wheat) at night
              Madhu should not be had in grishma rutu

3. Agni  Contradictory food with respect to Appetite
   Virruddha  E.g. Excessive eating in Mandagni, Eating less food in Teekshnagni

4. Matra  Contradictory food with respect to Matra(Quantity)
   Viruddha  E.g. Mixing Madhu (honey) and Ghrut (ghee) in equal proportions
              Equal Quantity of Madhu + Jala
              Equal Quantity of Madhu + Ghruta
              Equal Quantity of Jala + Sneha
              Equal Quantity of Madhu + Sneha
              Equal Quantity of Madhu, Ghruta, Vasa, Taila and Jala
5. **Satmya Viruddha**

Contradictory food with respect to Satmya (Habitual diet)

E.g. Having cold and sweet food by a person habituated to eating
Pungent, spicy & hot food.

6. **Dosha Viruddha**

Contradictory food with respect to Doshas

E.g. Continuously having food aggravating the doshas.

7. **Sanskara Viruddha**

Contradictory food with respect to Sanskara (preparation)

Sometimes food preparations made by combining two ingredients

can cause toxic reactions

E.g. Milk if boiled with Dadhi (curds) is viruddha

Madhu + Lotus seeds / Stem

Hot Water + Madhu / Bhallataka

Fish and pork prepared in Sarshapa taila is sanskara

viruddha (As.Sa.su. 9)

Ushna Dravya + Madhu

8. **Veerya Viruddha**

Contradictory food with respect to Veerya (potency)

Mixing ushna veerya dravyas with Sheeta veerya dravyas

9. **Koshttha Viruddha**

Contradictory food with respect to Koshttha (digestion)

E.g. having mild food in less quantity by a person who is constipated

or Having heavy food in more quantity by a person

who has diarrhoea

10. **Avastha Viruddha**

Contradictory food with respect to Lifestyle

E.g. Having Vatavardhak aahar by a person doing strenuous job

or Having Kaphavardhak aahar by a person doing sedentary job

11. **Krama**

Contradictory food with respect to Dietary Guidelines
Viruddha 177  E.g. Having food without attending nature’s call or Having food when there is no appetite
Drinking water then having sattu and again water

12. Parihar  
Viruddha 178  E.g Having food, hot in potency after eating Pork

13. Upachar  
Viruddha 178  E.g. Having cold food/water after eating Ghrut(ghee)

14. Paka  
Viruddha 179  E.g. Having half cooked or overcooked/burnt food

15. Samyog  
Viruddha 180, 181  Contradictory food with respect to Combinations
E.g. Having Milk with Sour food
Some dravyas act viruddha due to their similar or dissimilar properties
  e.g Similar properties – Milk Madhur rasa-Sheeta veery-Madhur vipak; Panas(Jackfruit) is also of similar properties but they are opposed to each other.
  Dissimilar properties – Milk & Matsya(fish) Both are Madhur rasa – Madhur vipak but Milk is sheeta veerya while Matsya is usha veerya; Milk+ Kulattha. Milk is Madhur vipak –Sheeta veerya; Kulattha is Amla vipak –Ushna veerya,

16. Hrid  
Viruddha 182  E.g. Having food which is not as per liking

17. Sampat  
Viruddha 183  E.g. Having raw fruits or overripe fruits or Rotten fruits
18. **Vidhi** Contradictory food with respect to Dietary Guidelines

**Viruddha**<sup>184</sup> E.g. Having food in crowded places or while talking etc.

**Samyog Viruddha**<sup>185, 186, 187, 188, 189, 190, 200</sup>

- Gramya /Anup Mansa/Audaka Mansa + Til (Sesame)/Guda (Jaggery) / Masha (Blackgram)/ Mulak (Raddish) / Bisa (Lotus Stem) / Virudhaka (Sprouts) / Navankur dhanya
- Guda / Sharkara + Matsya
- Talphala + Kadaliphala
- Masha + Lakucha Phala
- Madhu / Guda + Kakamachi
- Madhu + Gramya /Anup/AudakaMansa

**Combination of milk with the following items is contraindicated**

- Dahi
- All Amla drava dravya or Ghana dravya
- Salt
- Varak
- Virudha (sprouted grains) / Kulattha / Tilapishta /Makushtaka / Kulattha / Masha (Black gram) / Nishpava
- Valli phala / Chattraka (Mushroom) / Vetragra (bambooshoots)/ Amra (Raw Mango) / Lakucha phala /Matulunga (Sweet Lime) / Karamarda (?) Wild Gooseberries) / Mocha (Banana) / Jambu (Roseapple) / Tintidika (Tamrind) / Akhrot (Walnut) / Kathal (Jackfruit) / Narikela (Coconut) / Dadima (Pomogranate) Amalaki (Indian Gooseberries)
- Chilichim matsya / Jaliya mansa / Matsya
- Aja mansa / Varaha mansa / Gramya / Anup mansa / Rabbit / Shukara mansa
- Madya / Taila

**Dadhi is contraindicated with the following:**

- Virudhaka
- Lakucha phala
- Dadhi/ Takra with Kadaliphala
- Dugdha / Dadhi / Yusha + Lakucha phala

**Some food substances contradictory to each other**

- Navaneet + Mulak
- Sauviraka (Kanji) + Til shashkuli
- Masha supa + Mulak
- Masha supa + Guda/Madhu/Ghruta
- Kadali + pippali/Maricha
- Sura, Krushara & Kheer should not be had in combination.
- Sura + Krushara / Payasa
- Sheeta dravya and Ushna dravya should not be eaten together
- Freshly harvested cereals and stored cereals should not be mixed together
- Raw, unripe fruits and ripe fruits should not be mixed together

**Effects on the body** - Dhatu Virodhi. Causes Badhirya (Deafness), Blindness, Sharir Kampa (Tremors), Jadata, Aspashta Vaka (Slurred Speech), Minmin (Nasal voice), Death

A person who does not safeguard his own interests, who gives in to the cravings of food, who does not take into consideration the ill-effects of incompatible diet falls prey to various diseases, indriya daurbalya and finally death. The food thus ingested causes dosha prakop or dhatu dushti thereby creating vikara.  

Acharya Vagbhat has mentioned that viruddha aahar can cause visphot (skin disorder), shopha (swelling), mada, vidraddhi (abscess), gulma, yakshma (debility), destroys teja (lustre), bala(strength), smruti(memory), mati (intellect), indriya(senses) and mind. Apart from this it causes eight serious diseases (Vata-vyadhi, Ashmari, Kushtha, Prameha, Udara, Bhagandar, Arsha, Grahni).  

Vyadhis caused due to Virudhanna (according to Acharya Charak)

- Kilasa, Kushtha (skin diseases), Grahani (colitis), Shotha (swelling), Amlapitta (hyperacidity), Jwara(fever), Peenasa (sinusitis), Santanadosha (disorders in the next generation), Death
Process of Digestion \(^{195,196}\)

Various types of food vis. aashita, peeta, leedha, khadita is eaten by a person.

\[\downarrow\]

Action of Prana vayu

Transports food towards the stomach where the food is disintegrated by fluid( juices ) and softened by fatty substances.

\[\downarrow\]

Action of Jatharagni

**Pachak Pitta** and **Saman Vayu**

Food gets acted upon by the digestive fire with the association of samana vayu.
The food composed of six rasas immediately after it is ingested undergoes the stages of prapaka(preliminary digestion).

\[\downarrow\]

**Avastha paka**

**Madhur Avasthapaka** - the first phase is dominated by production of kapha(kledak) in large quantities as a result of which the entire mass of food is made sweet

**Amla Avasthapaka** - the second phase is dominated by the production of pitta (pachak) in large quantities resulting in the entire mass of food becoming sour

**Katu Avasthapaka** the third phase is dominated by production of vata in large quantities resulting in food becoming pungent

Action of **Panchbhautika Agni**

This food is digested by the panchbhautika agni with the help of Jatharagni (gastric fire). Five agnis pertaining each to Prithivi, Aap, Teja, Vayyu, Aakash digest the respective fractions of the food.In body, the substances and their properties nourish their counterparts respectively such as the fraction of prithivi in food nourishes the respective fractions in the body and so on.

Like Kala (time) this aahar keeps on flowing through all the dhatus simultaneously gets digested by the **ushma (heat)\& vayu** .

\[\downarrow\]

Action of **Dhatvagni**
The food thus digested and converted by the jatharagni and dhatvagni bestows Bala (strength), Shariropachaya (growth of the body), Sukha (happiness) and life.

Thus for the normal functioning and growth of the body Sharir dhatus use aahar ingested, convert it in the form beneficial for the respective dhatus and maintain samyavastha (balance)

In this way all the materials of the human body are produced from food only. From aahar which has permeated in the whole body, all the the activities in the body are made possible, without any interruption for longer periods of time. A person is endowed with health, strength and growth, till all the effects of actions earned continue to prevail in normal course.

On the other hand excess production of essence of food or its obstruction in the channels, which will interfere with the continuous supply of nutrition of the dhatus will cause termination of all the activities or makes the body a victim of diseases.(6/30)
Digestion

Aahar Parinamakara Bhava

Digestion of aahar is dependent on two factors –

1. Pradhan hetu (main factor)    2. Sahayyak hetu (subordinate factor)

Jatharagni (gastric fire) is the main factor - it digests the food.

Vayu, kleda (kapha), sneha (moisture/unctuousness) kala (time) and samyog (combinations of various food items) are the subordinate factors which assist in digestion.

The factors which are responsible for digestion and assimilation of food are called ‘Aahar Parinamkara Bhava’. These factors are –

1. **Ushma** (Jatharagni, Bhutagni and sapta dhatvagni) digests the food.

Pachakagni (gastric fire) which is situated between aamashaya (Stomach) and pakvashaya (colon) digests four types of food and differentiates it into dosha, rasa, mutra purish etc. states acharya Sushrut.

2. **Vata** pushes the food downwards by which it reaches the jatharagni. Prana, Apana and Saman are the three vayu which aid in digestion. Of these prana resides in the mouth, Saman vayu resides in the aamashaya and Pakvashaya and Apana functions in the pakvashaya region. Prana vayu helps the food to proceed further in the digestive system. Saman vayu is the key factor in digestion. It accepts the food brought forward by prana vayu and digests it with the help of gastric fire. After digestion it classifies it into saara (useful part) and kitta (useless part). This useful part is directed to the sira for further circulation and assimilation while the waste products are pushed towards apana vayu. The waste products are separated into mutra (urine) and purish (faeces) and excreted due to the action of apana vayu.

3. **Kleda** (kapha) breaks the food particles or moistens the food. Bodhak & Kledak kapha is associated with digestion of food. It resides in the mouth in the form of saliva. According to acharya Sushrut kledak kapha resides in the Aamashaya. Bodhak kapha which resides in the mouth helps to recognise taste which in turn ignites the
appetite through the preferential rasas ingested by a person. Kledak kapha aids in moistening the food by its properties like drava, snigdha, picchila etc. and aids in digestion. Thus, all the three doshas help in the process of digestion. When these doshas are in equilibrium the process of digestion is carried out smoothly but when they are in disequilibrium they are responsible for causing diseases like indigestion, lack of appetite etc.

4. **Sneha** (ghrut etc) softens the food. The two factors drava and sneha help in the process of digestion. Water taken along with the food helps to disintegrate the food and sneha (fats) in the food soften it.

5. **Kala** (Time) - A certain time is required for the whole process of digestion right from its breakdown to assimilation, circulation and excretion. According to Ashtanga Sangraha food gets digested in four yama (1 yama = 3 hours). Thus it takes 12 hours to complete the process of digestion. This time also differs according to the type of agni. Teekshnagni (strong appetite) digests the food earlier than the stated time while Mandagni (reduced appetite) takes a longer time.

6. **Samayoga** (combination) – Food undergoes various processes like roasting, cooking, broiling, baking etc. before eating. Different food items are used in combinations to make recipes. Some are wholesome while some are harmful for the body. The combinations beneficial to the body help to keep all the dhatus in equilibrium. The various types of aahar ingested is brought to the koshtha. Due to drava (liquid) it is broken down. Due to sneha it is softened and digested by saman vayu just as in the outer world rice gets cooked due to fire and water.

**Dhatu samya throught Aahar**

Having aahar in moderation which is Desha, Kala and sharir gunaviparita, avoiding extreme food habits, not withholding the vegas (natural urges), avoiding too strenuous activities bestows swasthya (good health).

Sharir Dhatus increase due to constant and regular intake of food which is similar or possess similar gunas as those of the dhatus. Reduction or decrease of the
Agni and Aama Nirmity

Life span, complexion, strength, health, enthusiasm, corpulence, lustre, immunity, energy, heat processes and vital breath – all these depend on body – fire. One dies if this fire is extinguished, lives long free from disorders if it is functioning properly, gets ill if deranged, hence agni (digestive fire) is the root cause of all 204.

That food nourishes dhatus, ojas, strength, complexion etc, depends on agni because rasa etc. cannot be produced from undigested food 205.

Amongst all the 13 agni present in the body, pachakagni which digests the food is regarded as the master of all agnis. Rest of the 12 agni depend on it. The increase or decrease in functioning of pachakagni causes its reaction on rest of the 12 agni. i.e increase of the pachakagni causes increase in the 5 bhutagni or 7 dhatvagni while reduction in the functioning of the pachakagni causes diminished functioning of the rest of the agni. Hence, to maintain health of pachakagni it is of utmost importance to be vigilant about the food intake. Sustenance of life is dependent on it. One who eats greedily leaving aside all the rules acquires the disorders due to morbidity in grahani soon 206.
Causes for Aama

- Atyashana (overeating), Viruddhanna (incompatible diet), Atyambupaana (excessive water intake), Akala Bhojan
- Excessive intake of guru, ruksha, sheeta, shushka, drava food
- Dwishta (Food which has created repulsion in the mind for some reason), Apavitra (unhygienic food)
- Vishtambhi (food which creates constipation), Vidahi (food which causes burning sensation)
- Psychological causes – Kama, Krodh, Lobha, Moha, Irshya, Hri (shyness), Shoka, Manodvega (mental irritation), Bhaya, Upatapta Manas (Stress)

Samprapti of Aama Nirmiti

Abhojana (fasting), ajeerna (intake of food though having indigestion), atyashana (overeating), vishamashana (irregular intake of food with respect to time and quantity), asatmya bhojan (food opposite to habitual diet), guru, sheeta, atiruksha (excessive dry), dushta aahar (contaminated food) causes derangement of agni. This dysfunction of agni cannot digest even simple light food taken. This undigested food become shukta (amla/acidic) and thus becomes toxic. It is unable to nourish the dhatus since the aahar rasa formed is vitiated.

Definition of Aama

Due to the weakness of agni (gastric fire) the food remains undigested and vitiated due to aggrevated doshas. This undigested and vitiated form is called as ‘Aama’. This aama is caused due to the association and aggrevation of doshas. When doshas and dhatus come in contact with this vitiated aama they are termed as saam Dosha or dhatu. The diseases thus caused are called as saam roga.

Symptoms due to Aama

That indigestion exhibits the following symptoms – stasis of food, malaise, headache, fainting, giddiness, stiffness in back and waist, yawning bodyache, thirst, fever,
vomiting, gripping, anorexia and improper digestion of food. The severe food toxin when combined with pitta produces burning sensation, thirst, and disorder of mouth. Acid gastritis and other paittika disorders. When combined with kapha it produces kaphaja disorders. It produces various vatika disorders if combined with vata. Affecting urine, faeces and rasa etc. (dhatus) it causes disorders of urine, belly and dhatus respectively.

Digestive fire if irregular causes disequilibrium in dhatus because of irregular digestion (of nutrients) and if intense having little fuel dries up the dhatus. The normal digestive fire in a person taking proper food maintains the equilibrium of dhatus by regular digestion 211.

The weak digestive fire burns the food incompletely which goes upwards or downwards. When it moves out downwards either in ripe or unripe condition. A person who habitually has Viriddhashana, Adhyashana (overeating), Who takes food when suffering from Ajeerna (indigestion) develops Aamavisha (aama dosha which causes toxicity symptoms). This aama dosha is incurable.

Samprapti of Dushta Stanarbud

Tri Doshaprakopak Aahar

↓

Dosha Vikruti

↓

Jatharagni Vikruti – Agnimandya

(Reduced Gastric fire – Diminished digestive activity)

↓

Agni vaishamya + Dosha Vaishamya lead to Dhatu – Mala vaishamya

↓

Dhatvagnimandya – Reduced metabolism of the dhatus)

↓

Saam Saar bhaga

Apakva saam Rasa circulated in the whole body through Vyan Vayu

↓

Leads to asarta of dhatus

↓

87
Causes   Srotas Dushti (Kha vaigunya)  
(Creation of Lacunae in the systems)  

Symptoms like overproduction, obstruction or growth in the respective srotasas. In this case Srotodushti of Rasa-Rakta- Mansa-Medovaha srotasa  

Due to vitiated Doshas and Srotas vaigunya  

Roga Nirmiti  -Formation of Shotha, Granthi, Arbuda  at the site of Khavaigunya  
(here in this case Dosha vruddhi + Dhatu dushti in stana)  

Due to gradual vitiation of the dhatus deeper penetration of the doshas causing  
Dhatugata avastha  

Thus Dushta Stanarbuda
Food is the necessity of man. It is a mixture of different nutrients such as carbohydrate, protein, fat, and vitamins and minerals. These nutrients are essential for growth, development and maintenance of good health throughout life. They also play a vital role in meeting the special needs of pregnant and lactating women and patients recovering from illness.

**Definition of Nutrition (WHO)**

Nutrition is the intake of food, considered in relation to the body’s dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity.

**What is a balanced diet?**

A balanced diet is one which provides all the nutrients in required amounts and proper proportions. It can easily be achieved through able and of the four basic food groups. The quantities of foods needed to meet the nutrient requirements vary with age, gender, physiological status and physical activity. A balanced diet should provide around 50-60% of total calories from carbohydrates, preferably from complex carbo-hydrates, about 10-15% from proteins and 20-30% from both visible and invisible fat. The diet that one consumes must provide adequate calories, proteins and micronutrients to achieve maximum growth potential.

In addition, a balanced diet should provide other non-nutrients such as dietary fiber, antioxidants and phytochemicals which bestow positive health benefits.
benefits. Antioxidants such as vitamins C and E, beta-carotene, riboflavin and selenium protect the human body from free radical damage. Other phytochemicals such as polyphenols, flavones, etc., also afford protection against oxidant damage. Spices like turmeric, ginger, garlic, cumin and cloves are rich in antioxidants.

Classification of food

According to functions of food:

Table 5 . . Classification of Food based on Function

<table>
<thead>
<tr>
<th>MAJOR NUTRIENTS</th>
<th>OTHER NUTRIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy–rich Foods</td>
<td></td>
</tr>
<tr>
<td>Carbohydrates and Fats</td>
<td>Protein, fibre, minerals, calcium, iron &amp; B-complex</td>
</tr>
<tr>
<td>Whole grain cereals, millets</td>
<td>vitamins</td>
</tr>
<tr>
<td>Vegetable oils, Ghee, Butter</td>
<td>Fat soluble vitamins, essential fatty acids</td>
</tr>
<tr>
<td>Nuts and Oilseeds</td>
<td>Proteins, vitamins, minerals</td>
</tr>
<tr>
<td>Sugars</td>
<td>Nil</td>
</tr>
<tr>
<td>Body Building Foods</td>
<td></td>
</tr>
<tr>
<td>Proteins</td>
<td>B-complex vitamins, invisible fat, fibre</td>
</tr>
<tr>
<td>Pulses, Nuts and Oilseeds</td>
<td>Calcium, vitamin A, riboflavin, vitaminB12</td>
</tr>
<tr>
<td>Milk and Milk products</td>
<td>B-complex vitamins, iron, iodine, fat</td>
</tr>
<tr>
<td>Meat, Fish, Poultry</td>
<td></td>
</tr>
<tr>
<td>Protective Foods</td>
<td></td>
</tr>
<tr>
<td>Vitamins and Minerals</td>
<td>Antioxidants, fiber and other carotenoids</td>
</tr>
<tr>
<td>Green leafy vegetables</td>
<td>Fiber, sugar and antioxidants</td>
</tr>
<tr>
<td>Other vegetables and Fruits</td>
<td>Protein and fat</td>
</tr>
<tr>
<td>Eggs, milk and milk products, flesh</td>
<td></td>
</tr>
<tr>
<td>foods</td>
<td></td>
</tr>
</tbody>
</table>

According to Food Groups:

The Five Food Groups:

According to the food guide the five food groups are:
1. Pulse-milk-egg-meat-fish group of Body building foods
2. Protective vegetable and fruits group
   (a) Green and yellow vegetables and fruits group
   (b) Amla-guava-citrus fruits group
3. Other vegetables and fruits group
4. Cereals and millets group
5. Oils, fats and sugars group

Each group supplies some nutrients and not all nutrients. A combination of items selected from each of the five groups in the right proportion is ideal and will work towards a balanced diet.

**Pulse-Milk-Egg-Meat-Fish Group or Body-Building Foods**

The foods included in this group are important for their protein content. Proteins are required for replacing the wear and tear of the body and building of tissues. These foods also supply some amount of the B-vitamins such as thiamin, riboflavin and niacin. Eggs, milk and liver are good sources of iron and milk is a good source of calcium. One serving of this group supplies about 5-6 grams of protein.

Pulses include all types of *dal* *s*, e.g. *mungdal, turdal, masur dal* etc. Legumes include all dry whole grams, beans, peas, etc. Nuts and oil-seeds include those in common use such as sesame, which can be included in sufficient amount to contribute to the daily protein intake.

**Serving Unit:** 1 serving = 25g of each of these

Milk includes curds and other preparations containing whole milk (5-6 percent).

**Serving Unit:** 1 serving = An average teacup or 150 ml

Egg in a diet means a hen's egg.

**Serving Unit:** 1 serving = One egg (40-50 g)

Meat-Fish-Poultry refer to lean parts of the animal. The protein content of the lean parts is the same but if the adhering fat is not removed, the protein content decreases in the portion of meat.
The Protective Group Including Vegetables and Fruits
This group is a rich source of beta-carotene (a precursor of vitamin A). It includes the dark green leafy vegetables such as spinach, fenugreek, radish, amaranth, coriander leaves, the light green leafy vegetables such as cabbage, and onion-tops and deep yellow vegetables and fruits such as carrots, orange, red pumpkin, mango, papaya and apricots.

**Serving unit:** 1 serving = Half a cup or 50-75 gm of the cooked vegetable or chopped fruit. Whole fruits such as mango and orange maybe counted as one serving.

Almost half a day's need for vitamin A is satisfied by one serving of this group.

Vitamin C-rich Vegetables and Fruits
This group includes fruits and vegetables such as *amla*, lemon, *ber*, guavas, drumsticks, cabbage and all citrus fruits such as oranges, grapes, and all other fruits such as papaya, pineapple, tomato, strawberries, etc.

**Serving unit:** 1 serving = Half a cup of fruit or 50-75 grams of vegetable /portion
As ordinarily served such as a slice of papaya or an orange. The foods in this group area rich source of vitamin C and fiber.
At least one serving of this group must be eaten every day.

Other Vegetables and Fruits Group
These include brinjal, cucumber, pumpkin, *bhendi*, all ash-gourds i.e. bottle, snake, ridge gourds, etc.; all immature beans and peas, beetroot, radish, potatoes, sweet potatoes and yam. Other fruits include bananas, apples, melons, grapes, berries, etc.

**Serving unit:** 1 serving = Half a cup or 50-75 gm of these.
An intake of at least two or more servings of this group are recommended per day.

Cereals and Millets Group
Foods in this group provide carbohydrates, proteins and calories. The seeds of plants are richer in thiamine than all other portions of the plant. Cereals such as wheat and rice may then be considered as a good source of thiamine.
The foods in this group are edible seeds of plants belonging to the grass family. They are preparations of rice, wheat, jowar, bajra, maize, ragi (nachni) and their products such as suji, rice flakes, vermicelli, etc.

**Serving Unit:** 1 serving = Any preparation containing 25g of the cereal may be counted as one serving. In practice, it means half a cup of cooked rice or one medium chapati, two to three puris, or one small roti, one slice bread, 25g rice flakes or any ready-to-eat cereal.

At least six or more servings may be selected from this group. In order to improve the quality of protein, the meal may include two or more cereals and using a cereal and pulse-legume combination, e.g. khichdi using rice and tur dal, has better protein quality than rice alone.

**Sugar and jaggery, Fats and Oil Group**

Foods in this group mainly supply energy. This group is hence known as the *fuel group.* Sugar and jaggery release energy very easily, while fats and oils are concentrated sources of *reserve* energy.

Jaggery (gud) is the unrefined concentrate obtained from sugarcane juice. It is commonly used in several preparations in our country. It is a good source of minerals especially iron since it is prepared in iron vessels.

Sugar is mainly used to sweeten beverages like tea and coffee, sherbets and squashes. *About 25 g per day is sufficient.*

**Oils and Fats:** Oils and fats are used for seasoning our food. They improve the palatability, flavour, texture and satiety value of food. Apart from this, oils and fats are also important as they carry fat-soluble vitamins like A, D, E and K into the body and to the tissues. Hydrogenated fats are generally fortified with vitamin A. It is therefore, advisable to use these in the daily diet.

Oils include all vegetable oils such as groundnut, sesame, coconut, sunflower, mustard, safflower, com, soyabean, palm, etc.

Fats include ghee, butter, margarine as well as hydrogenated vegetable oils commonly called vanaspati.
Oils, besides giving energy, are invaluable for the essential fatty acids (polyunsaturated) that they supply. These fatty acids are found in all oils and fats in more or less amounts. Especially rich in these are safflower, com, soyabean, cottonseed and sunflower oils. The Recommended Dietary Intakes (1988) suggested that fat in the diet should not exceed an amount that can provide 15-20 percent of the total recommended calorie intake. Fat intake should include at least 15g of vegetable oils in order to meet the requirement of essential fatty acids. In young children, fat in the diet should not provide more than 25 percent of the total calories of the diet. However, for all age groups about half of this will come from invisible fat in the diet.

**Dietary Fibre**

Dietary fibre delays the intestinal transit of the food consumed. Dietary fibre is important for proper bowel function, to reduce chronic constipation, diverticular disease, haemorrhoids, coronary heart diseases, diabetes and obesity. They also reduce plasma cholesterol. The protective role of dietary fibre against colon cancer has long been recognised.

**Antioxidants**

In the recent past, the role of vegetables and fruits as sources of antioxidants has been receiving considerable attention. Antioxidants restrict the damage that reactive oxygen free radicals can cause to the cell and cellular components. They are of primary biological value in giving protection from certain diseases. Some of the diseases that have their origin in deleterious free radical reactions are atherosclerosis, cancer, inflammatory joint diseases, asthma, diabetes etc. Raw and fresh vegetables like green leafy vegetables, carrots, fresh fruits including citrus and tomatoes have been identified as good sources of antioxidants (free radical-scavengers). The nutrients vitamin C and carotenoids that are present in these vegetables are also potential antioxidants. Different coloured vegetables provide different antioxidants like orange coloured provides b-carotene, deep red provides betalines, blue and purple provide anthocynins.
**Miscellaneous Foods** - This category is not included in the Basic Five Food groups, but the items listed herein are an integral part of the Indian diet. They are spices and condiments, pickles, *papads* and *chutneys*. All these either impart taste and typical aroma to food or contribute to one or the other nutrients, e.g. the *paan* (betel leaf smeared with calcium hydroxide) is an rich source of calcium. Salt is the essence of our daily food and provides sodium, which is essential for our muscle control.

**Dietary fats and breast cancer**
Fats include oils, butter, margarine, cheese, cream, ice cream as well as the fat in meats, fish and nuts. There are also hidden fats ready made foods like sweets, biscuits, cakes, savoury snacks, chocolate products and other foods. The EPIC (project of iarc) study has shown that women who ate higher levels of saturated fats had double the risk of breast cancer compared to those eating the least.

**Sugars, carbohydrates and breast cancer**
There is no strong evidence of a direct link between sugars and carbohydrates and breast cancer. But a large study of Chinese women in the USA reported in 2009 that for women younger than 50 a high carbohydrate diet slightly increased the risk of developing breast cancer. And the EPIC study showed that high carbohydrate diets are linked to an increased risk of a type of breast cancer called oestrogen receptor negative breast cancer.

Eating too much sugar can make you put on weight and we know that being overweight increases the risk of breast cancer in post menopausal women.

**Dairy foods and breast cancer**
Dairy products have been studied for their effect on breast cancer risk. Some recent studies have shown that women with a high intake of dairy products have a lower risk of breast cancer, but these results are inconclusive. Dairy products are high in calcium, and several studies show a lower risk of breast cancer for women with high calcium intakes or calcium blood levels.
Fibre and breast cancer
Fibre is found mostly in fruit, vegetables and whole meal cereals (including flour and all kinds of bread, particularly whole grain). There is some evidence that diets containing more than 25g of fibre per day reduce the risk of breast cancer in premenopausal women.

Eating wheat bran fibre has been found to lower the levels of oestrogen in the blood in women who have not yet had their menopause. Lower levels of oestrogen may help to reduce the risk of breast cancer. Researchers aren't quite clear about why wheat fibre reduces oestrogen levels. It may not be an effect of the fibre itself. Instead it may be that high fibre diets contain less fat and more antioxidants than low fibre diets.

Fruit and breast cancer
An overview study found that women who ate more fruit had a lower risk of breast cancer. This may be due to the fibre and antioxidants that they contain. Anti oxidants are molecules that prevent a chemical process called oxidation, which occurs when oxygen molecules join with another chemical. Oxidation can cause gene damage in cells that may lead to cancer. Antioxidants include vitamins A, C and E and selenium.
ANUVANSHIKTA

Vansha means descendants of one’s individuals. Anu is to follow. Thus anuvanshikta can be termed as the traits which descend from one generation to another. In other words Anuvanshikta denotes Heredity. In the scriptures inbreeding or progeny from marriage in close relations is prohibited. This indicates that the role of heredity was prevalent in those times also. Acharya Charak has also advised mating a female from a different lineage than that of the male. While classifying diseases acharya Vagbhat has mentioned vyadhis of seven types of which the foremost is ‘Sahaj’. Sahajroga means disorders caused due to vitiation of Shukra and/or Artav. Kushta (leprosy), Prameha(diabetes),obesity , Arsha(piles) etc. This denotes the dominance of Maternal and Paternal factors in the causation of disease 212.

Importance of anuvanshikta can also be understood according to the classification of diseases described in Sushrut Samhita. Vyadhis (diseases) have been described of three types according to Sushrutcharya. Aadhyatmika, Adhibhautika& Adhidaivika, which have been further categorised in seven types. Of these seven types Aadibalapravritta, Janmabalapravritta, Doshabalpravritta are included in Aadhyatmika vyadhis. Aadibala pravritta vyadhis are caused due to maternal or paternal factors.

Acharya Charak has also mentioned Heredity as a causative factor in occurrence of diseases like Prameha, Arsha. Prameha or Arsha caused due to beeja dosha is considered asadhya(incurable) by Acharya Charak. Sahaj Arsha is caused due to maternal factor according to him 214.

Beeja

Beeja is synonymous with Shukra in males and Aartav in females. It is one of the synonyms for shukra.

Synonyms for Shukra – Teja, Retas, Beeja, Veerya, Indriya 215

Formation of Aartav
Aartava is formed from rasa. It is one of the updhatus of Rasa dhatu. Its function starts at the age of twelve and stops around fifty years of age. Though Rasa is mild in nature Rajas which is formed from it is ushna since the garbha (foetus) formed from it is a union of Agni and Soma. According to acharyas the universe is made up of two forces. Agni (Heat) and Soma (Cold). These two forces balance each other.

**Factors necessary for a Healthy Progeny**

Acharya Sushruta states collective factors necessary for conception. They are Rutu that is the proper menstrual cycle, Kshetra denotes abode. It refers to the Uterus of the female, Ambu denotes the digested aahar rasa which provides nutrition to the foetus. Just as water is necessary for life aahar rasa is necessary for proper growth of the foetus. Beeja is combined reference of Artava and Shukra. Thus Acharya sushrut has taken into consideration the anatomy and physiological aspects important for a healthy progeny.

If Shukra, Aartav, Atma, Ashaya and Rutukala are ideal without any faults, if the mother takes nourishing diet which is necessary for the growth of the foetus then only a proper foetus grows in the womb and takes birth.

**Formation of Shukra**

Shukra is the element which is necessary for conception. It considered as having four supports viz. Vayu, Agni, Bhumi and Aapa and is formed by six raras.

Shukra is the seventh dhatu and is formed from majja dhatu. It takes a month to form shukra dhatu from aahar rasa. According to some acharyas it takes one day while some consider it takes six days for the shukra to be formed. The aahar rasa gets circulated in the body through vyan vayu. This rasa remains in each dhatu for 3015 kala. According to this calculation Shukra is formed in a month and the same way Aartava is formed in a month. After the digestion of food aahar rasa is formed from which rasa dhatu comes into existence the same day. After that each dhatu takes five days for its formation. Some acharyas propound that Shukra is formed in a day, according to some it takes seven days while some quote eight days.
Shukra Sampat  (Ideal qualities of Shukra)  

- Sphatikabha (traluscent)
- Drava(liquid) in consistency
- Snigdha(unctuous)
- Guru (heavy)
- Picchila(slimy)
- Avidahi (non – irritant/ soothing)
- Saumya (mild)
- Madhur(sweet)
- Madhugandhi(smelling like honey)
- Avisra (not having a foul smell)
- Appearance should be like taila(oil) or honey.

In short shukra should be mild, unctuous and should be clear.

Site  

Shukra is present in the whole body and its main sites are Stana and Vrushan(Testes). Acharya Charak has mentioned Shefas(Penis ) and testes as the main sites of Shukravaha srotasa.

Just as the juice is present in invisible form in sugarcane or Ghrut is present in milk the same way shukra is present in the whole body and is expressed through shhukravaha srotas.

Measure of Shukra  

Ardha Anjali (Anjli = measure of hollow formed by edges of palms joined together.)According to Sushrutacharya the exact measure of Shukra cannot be described.

Functions of Shukra  

- Beejartha - Main and supreme function is reproduction
- Dehabala (Gives physical strength )
- Imparts Dhairya (mental strength)
- Creates Harsh ( feeling of happiness)
- Preeti (affection)
Symptoms due to imbalance of Shukra

**Shukra vruddhi Lakshan** 232

- Overindulgence in sexual pleasures
- Can cause Shukraashmari

**Shukrakshaya Lakshan** 233

- Late ejaculation of shukra or can sometimes cause bleeding
- Pain in the testes
- Burning sensation in the penis

**Causes for Vitiation of Shukra** 234

Due to excessive coitus, exercise, use of unsuitable things, untimely coitus, in non-vagina and abstinence therefrom, excessive intake of rough, bitter, astringent, salty, sour and hot things, ignorance about the taste of woman, abnormal discharge, old age, anxiety, grief, suspicion, faulty application, fear, anger, exorcism, emaciation caused by diseases, suppression of urge, wound and morbid affection of dhatus, doshas singly or collectively, having reached the semen-carrying vessels cause defects in semen.

**Symptoms due to Shukra Dosha (vitiated shukra)** 235

Vitiation of shukra causes Klaibya (sterility), Aharshana (irrechtile dysfunction) in the affected male. If a conception occurs then the child is affected by the following symptoms:

- Napunsaka (Sterility)
- Alpayusha (short life span)
- Kurup (ugly)
- Vitiated shukra causes frequent miscarriage

Thus vitiated shukra can cause harm to the child and spouse.

**Eight types of Shukra dosha (Vitiated semen)** 236, 237

Shukra vitiated by Vata-Pitta-Kapha, which emits kunap gandh (cadaveric smell), grathita (is clotted), puti -puya (has the smell of pus), Ksheena (is very little in quantity) or mutra-purish gandh (has the smell of urine and faeces) is incapable of reproduction.
Acharya Charak has mentioned the following eight types of Shukra dosha - Phenila (frothy), tanu (liquid in consistency), ruksha (dry), vivarna (which has a different colour), puti (foul smelling), picchila (slimy), vitiated by other dhatu are the eight doshas mentioned by acharya Charak.

Semen vitiated by vata acquires colour and features characteristic of vata, that vitiated by pitta acquires colour and features characteristic of pitta; that vitiated by kapha acquires colour and features characteristic of kapha. The semen vitiated by rakta emits cadaveric smell and is profuse in quantity. The semen vitiated by Kapha and vata together gets clotted that by pitta and kapha together is like putrid, pus, that vitiated by pitta and vata together becomes less in quantity and has the characteristic features and that vitiated by a combination has the odour of urine and faeces. Out of these, the semen which has a cadaveric smell or is clotted or is like putrid pus, or else is less in quantity is only curable only with difficulty while that which has the odour of urine and faeces is incurable.

Vatadushit, Pitta dushtit and Kaphadushit shukra bears the characteristics of that particular dosha. Raktadushita shukra resembles pittadushit shukra. These doshas are curable. Kunapgandhi shukra smells like a corpse, if there is vitiation of rakta also it smells like ghrut (ghee) or taila (oil). Granthi shukra is caused by vitiated kapha-vata. Puti-puya is caused due to vitiation of pitta-kapha. Ksheena shukra is caused by vitiated pitta-vata and dhatukshya.

Mutra-purishgandhi is caused by vitiation of all the three doshas and is incurable.

Artava
One which is generated with regular interval is called as Artava\textsuperscript{238}.

Artava
Synonyms\textsuperscript{239} – Rakta, Asruk, Lohita, Shonita, Pushpa, Raja

Artava is described as the menstrual flow, which occurs every month for 3 days. This is one of the characteristics. Artav doesn’t denote only menstrual flow but it also signifies the beeja which is formed every month\textsuperscript{240, 241}.

Site\textsuperscript{242} – Garbhashaya (Uterus) and Aartavvaha Dhamanni (fallopian tubes and ovary) are the two main sites of Aatav.
Ideal Aartava\(^{243,244}\)–

- Should have a cycle of one month
- Menstrual cycle should be upto 5 days consecutively
- Menstrual flow should not cause any irritation, burning sensation or pain.
- Menstrual flow should not be too less / excessive.
- The colour of menstrual blood should resemble gunja phala, padma, Alakta or like indragopa insect.
- Aartava resembles rakta and the same is responsible for conception. It nourishes the foetus and also nourishes the stana. It forms stanya which is life for the baby\(^{245}\).
- Should not discolour the clothes

Artava Kshaya Lakshan\(^{246}\)–

- Reduced Menstrual flow
- Disturbed menstrual cycle
- Pain in the pelvic region

Artava Vruddhi Lakshan\(^{247}\)–

- Bodyache
- Excessive menstrual flow
- Foul odour

Acharya Sushrut has described eight shukra and aartav doshas viz. Vata, Pitta, Kapha, Rakta, Kunap, Granthi, Puti-Puya, Kshina, Mutra-Purisha gandha which can lead to problems for conception.

Artava also gets vitiated by three doshas viz. Vata-Pitta-Kapha and the fourth Shonita individually, in combinations of two or by all of them combined together, resulting in sterility. Vitiation of the doshas in them should be inferred according to their characteristic colour and features. Out of these one which emits cadaveric smell, is clotted is like putrid pus is scanty or has the odour of urine or faeces is incurable and the rest are curable.

Atma sampat –

Atma should be bound by the meritorious karma to bind with the shukra-Shonita\(^{248}\)
Ashaya Sampat –
Aashaya means abode. Here it refers to Uterus or Garbhashaya –Garbha + Ashaya – abode of the garbha. Acharya Sushrut has mentioned seven ashayas in humans. He has described three more in the females viz. two Stanyashaya and one Garbhashaya. Yoni where the conception takes place resembles like a shankha(conch shell)and comprises of three avarta (divisions). In the third avarta lies garbhashayya(where the ovum gets embedded) It resembles shape of Rohit fish.  

Site  
Garbhashaya is situated behind Basti.Since garbhashaya is the site where the foetus gets embedded and grows, it should be ideal without any deformity or disease. 20 yoni vyapadas are mentioned in ancient ayurvedic texts some of which can cause infertility or difficulty in conceiving.

Kala Sampat  
Kalasampat refers to rutukala. Acharyas have described rutukala as the timespan in which conception can occur. This span is of twelve nights.(Su.Sha. dalhan tika)
Garbhavkranti (Conception to Birth of a child) 252 –

Shuddha Shukra + Shuddha Aartava & Healthy reproductive organs (yoni – Garbhashaya)

Coitus during Rutu kala (period when conception is possible)

Shukra + Artava Samyog. Descendence of atma along with mana

Garbha formation

Garbhincharya - Healthy diet regime and correct conduct followed during pregnancy

Proper intrauterine growth of the foetus

Due birth of a child in the ninth or tenth month.

Table 6. Garbha Masanumasika Vruddhi

<table>
<thead>
<tr>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prathama Masa</strong> 253, 254, 255 (1st month)</td>
</tr>
<tr>
<td>Advent of Atma in the uterus. This Atma takes the form of foetus as kapha, with</td>
</tr>
<tr>
<td>the combination of dhatus. It has all the necessary elements in the minute form.</td>
</tr>
<tr>
<td>Acharya Sushrut has termed it as ‘Kalala’ (soft mass).</td>
</tr>
<tr>
<td>According to Kashyapacharya Jeevatma divides the beeja according to skeletal</td>
</tr>
<tr>
<td>system. This beeja is engulfed or covered by rakta. This denotes zygote formation.</td>
</tr>
<tr>
<td>The bones and mansa (skeletal and muscular system) are formed from shukra.</td>
</tr>
<tr>
<td>From both (shukra – artava) the organs are formed.</td>
</tr>
<tr>
<td><strong>Dwitiya Masa</strong> 256, 257</td>
</tr>
<tr>
<td>In the 2nd month this kalala becomes solid. It assumes form of pinda (muscular</td>
</tr>
<tr>
<td>mass), Peshi (elongated mass) or arbud (solid mass).</td>
</tr>
</tbody>
</table>
(2\textsuperscript{nd} month) Pinda shape denotes male, peshi denotes female and arbud denotes enuch.
According to Sushrutacharya due to the action of sheeta(kapha), ushma(heat) and vayu(air) the kalala becomes solid. If it is in pinda shape it denotes male, if peshi denotes female and arbud denotes enuch.

| Truteeya Masa | (3\textsuperscript{rd} month) All the indriyas(special senses), avayava(organs) are initiated at the same time. In the third month five stumps - two of hands, two of feet and head are formed. According to Kashyapacharya all the indriyas(special senses), avayava(organs) are initiated at the same time. The senses of the foetus are very minute. It develops feelings and heart beats. |

The Maternal factors, Paternal factors are all formed from panchmahabhutas.

<table>
<thead>
<tr>
<th>Charak samhita</th>
<th>Sushrut samhita</th>
<th>Kashyap Samhita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akash Shabda, Shrotra Laghuta, sukshmata and vivek</td>
<td>Shabda, Shrotra All hollow spaces, viviktata(differentiation)</td>
<td>Shabda, Shrotra Laghuta, sukshmata and vivek Mukha, Kantha, Koshtha</td>
</tr>
<tr>
<td>Vayu Sparsh, Sparshanendriya Rukshata, Chalata, Dhatuvyuhan(movement)</td>
<td>Sparsh, Sparshanendriya Laghuta, Chalata, Spandan (throbbing)</td>
<td>Sparsh, Sparshanendriya Rukshata, Prerana, Dhatuvyuhan(movement of prana-apa)</td>
</tr>
<tr>
<td>Agni Rup, Chakshurindriya Ushma, Pachan, Prakash</td>
<td>Rup, Rupendriya Teekshnata, Pachan, Varna, Santapa, Bhrajishnuta, Shaurya</td>
<td>Rup, Chakshurindriya Prakash, Pakti, Ushma, Pitta, Sharirvruddhi</td>
</tr>
<tr>
<td>Jala Rasa, Rasanendriya</td>
<td>Rasa, Rasanendriya</td>
<td>Rasa, Rasanendriya</td>
</tr>
<tr>
<td>Prithvi</td>
<td>Characteristics</td>
<td></td>
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<tr>
<td>---------</td>
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<td></td>
</tr>
<tr>
<td>Gandh, Ghranendriya Sthairya, Kathinya, Gaurav</td>
<td>Garbha attains stability. It grows in size. According to Sushrutacharya — Differentiation of the organs becomes more clear. It attains shape. In this month the functioning of heart with respect to emotions is seen. The foetus expresses its likes or dislikes through the mother. She is called ‘Daurhudini’ i.e having two hearts.</td>
<td></td>
</tr>
<tr>
<td>Gandha, Ghranendriya All murta samuha, Guruta</td>
<td>Compared to other dhatus Mansa and Rakta develop. According to sushrutacharya Mana (mind) develops. It becomes more sharp.</td>
<td></td>
</tr>
<tr>
<td>Gandha, Ghranendriya Gaurav, Sneha, Murti</td>
<td>Bala (Strength) and Varna (complexion) get enhanced. According to Sushrutacharya Buddhi (intellect) becomes more defined. According to Kashyapacharya Bala, Varna and Ooja increase.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In this month the foetus develops and nourishes in all aspects. According to Sushrutacharya all the organs become well-defined. According to Kashyapacharya growth of the foetus is complete and the tridoshas (Vata-Pitta-Kapha) are also developed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In the month Ooja circulates from the mother to the foetus and back. Hence the mother exhibits mixed emotions. Sometimes she is happy and at times depressed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The foetus is fully grown and takes birth.</td>
<td></td>
</tr>
</tbody>
</table>
Six Factors for Formation of Foetus

Six factors take part in the formation of the foetus they are Mata(Mother), Pita(Father), Atma,Satmya, Rasa and Mana. Just as assembly of various parts is necessary in the making of a chariot the contribution of these factors is equally responsible for a healthy progeny.

Characteristics of a foetus

Formation of the Garbha(foetus) is due to four factors vis.Matruj, Pitruj, Aaharaj and Atmaj karma. The other four factors are Vayu, agni, Jala and Prithivi mahabhuta. The dominant factors among matruj, pitruj, atmaja karma and also the dominance of Manas guna decide the characteristics of the foetus.

Causes for normal growth or abnormal characteristics in a foetus

During conception the dosha which holds dominance is responsible for the prakruti of the child. This dominance is of two types- Prakrut & Vikruti. The dominance specified is in due natural course which imparts individual characteristics to the foetus which is termed as prakruti. It is of seven types. Vikruti denotes aggravation of the doshas. The natural dominance is prakruti while aggravation is vikruti.

Prakruti

The prakruti of a person depends on the following factors – Shukra Shonita PRakruti, Kala prakruti, Garbhashaya prakruti, Matruj Aahar-vihar prakruti and Mahabhuta Prakruti

- Prakruti of Shukra & Aartav – The qualities of Shukra of the male and aartav of the female
- Kala – Garbhashaya prakruti – This denotes the avasthika kala of the mother i.e the age of the mother and condition of the uterus at that time.
- Matruj Aahar-Vihar Prakruti – The diet taken by the mother from the time of conception also is to be taken into consideration.
- Mahabhuta Prakruti – The combined effect of mahabhuta combination of shukra-artava, dietary dravyas taken by the mother, atma and
Seven types of constitution get formed due to doshas; three from each of them separately, three in combination and one from the normalcy of all the three doshas. At the time of union of shukra and aartava and their stay in the uterus one or more of the doshas which get increased by the foods and activity of the mother gives rise to the constitution which persists till death; just as worms which are born in a poisonous plant or poisonous creatures from poison or just as the poison in the bodies of scorpion and snake, the human body also gets its constitutions formed from its own poison. (the doshas).

Since the shukra and aartava are the causes of the future body and are full of them and being natural to the body they do not harm the body; by their identical qualities (of food and activities) they help the body, even by the use of their opposite qualities they do not harm the body suddenly. If the doshas have become abnormally increased at that stage (time of shukra-Artava union) there will be no formation of the embryo at all; or if it gets formed it dies or becomes abnormal. Hence some others say – vata and other doshas are of two kinds viz. Normal and Abnormal. The normal ones are the cause for the formation of seven kinds of constitutions and also the chief causes for the formation of the body, they are called dhatu because they support the body; they are also the seeds for the abnormal ones known as vikruta dosha and are not dying (present till death); though all of them are co-existing in the body, the constitutions is named after that dosha which is predominant.

The abnormal ones are produced in the body as the waste materials of the essence of food after metabolism. They get nourished and grow from the normal ones, they undergo increase and decrease in their own quantity by the effect of season etc. sustain the body (maintain in health) and also vitiate it.

Organs formed from Matruj & Pitruj Factors:
Matruj Factors: Soft elements in the body, Twacha (skin), Rakta (Blood), Mansa (muscles), Meda (Adipose tissue), Nabhi (umbilicus), Hrudaya (Heart), Aamashaya (Stomach) and Garbhashaya (Uterus). Yakrut (Liver), Antra (Intestines) and
Guda (Rectum) are also formed from Matruj factor. Along with these factor Acharya Charak has also mentioned Pleeha (Spleen), Vrukk (Kidneys), Basti (Bladder), Purishadhana (Caecum), Pakvashaya (Large Intestine), Uttarguda (Sigmoid) Adharguda (Rectum), Kshudrantra (Small Intestine), Vapavahana (omentum) as Matruj factors.

**Pitruj Factors**

Kesha (hair), Nakha (nails), Asthi (Bones), Shukra (semen), Sira (veins), Snayu (Tendons) etc. all the solid elements in the body. Smashru (facial hair), Loma (body hair), Danta (Teeth), Dhamani (Arteries) are also formed due to Pitruj factor.

**Atmaja Factors**

To be born in various yoni (species e.g. Animals, birds, Human etc), descendence of Mana, Panch dnyanendriya (five special senses), Prana-Apana (vital force), to sustain life, Various forms of life, Psychological factors like Kama (sensual behavior), Krodha (anger), lobha (greed), Bhaya (fear), Harsha (happiness), Dharm (righteous conduct), Smruti (memory), Buddhi (intellect), Iccha (feelings), Dwesh (jealousy), Prayatna (efforts), sukha (happiness), Dukkha (sadness), Ayu (life), and Atmadnyana (Self-realisation).

**Satmyaja Factors**

Ayu (Life), aarogya (Health), Analasya (Energy), Alolupta, Indriyaprasad (clarity of senses), Swar-Varna-Oojaprashasti (excellence in voice, complexion and vitality), Praharsha (feeling of happiness), Medha (intellect) and Bala (strength).

**Rasaja (Aaharaja) Factors**

Dehasambhava Vrutti (Formation of foetus), Vruddhi (Growth of the foetus), Trupti (satiety), Achapalata (Activity of the foetus), Pushhti (nourishment of the foetus), Utsaha (Happiness).

**Psychological Factors**

Shaucha (purity), Astikaya (piousness), Krutadnyata (gratitude), Dakshinya (Charity), vyavasaya (industriousness), Shaurya (bravery),
Gambhirya (composure), Buddhi(intellect), Medha(Knowledge), Smruti(memory) etc. are the psychological characteristics of the foetus formed due to satva guna.

Durupacharata (who is imperceptible), Anryatva, Shaurya(bravery), Matsarya (Enviousness), Atibhashita (talkativeness), Dambha(arrogance), Mana(Ego), Krodha (Anger), Harsha and Kama are the psychological characteristics of the foetus formed due to rajas guna.

Adnyana (ignorance), Vishada(melancholy), Pramada(incorrect behavior), Nidra(sleep), Aalasya(lethargy), Kshudha(hunger), Trushna(thirst), Shoka(grief), Matsarya (jealousness) are the psychological characteristics of the foetus formed due to Tamas guna.

Thus the factors responsible for conception and healthy foetus are ideal shukra, ideal artava, normal uterus, atma, mana and rasa formed from habitual diet taken by the mother. In short the foetus is formed due to six factors viz. Matruj, Pitruj, Atmaja, Satmyaja, Rasaja and Mana (mind). Of these, four factors Matruja, Pitruj, Atmaja and Mana are cause for conception. Rasaja and Satmyaja can be described as environmental factors.

Role of These Factors in Causation of Disease

Acharya Charak states that the normal factors which are responsible for creation of human being are also responsible for creating disease when they become abnormal.

Abnormal Characteristics of Foetus

When shukra is vitiated totally, conception does not occur. But when it is partly vitiated it causes deformity in that part of the organ. The aggrevated dosha in that particular part creates deformity. e.g.- If there is deformity in the beejabhaga related to sight the child thus born will be blind.

Causes for a deformed Foetus

- Due to deformity in the beeja i.e shukra or aartav (sperm or ovum)
- Due to bad deeds in the past life
- Due to defect or disorder in the aashaya
• Improper rutu kala
• Due to unhealthy diet taken by the mother during pregnancy

These can lead to imbalance in the doshas thus causing deformities in the shape, appearance or in the structure or function of the indriyas. Just as a tree fallen in a river during storm gets carried away with vigourous force gets mutilated, in the same way a foetus gets deformed due to imbalanced doshas.

**What causes abnormalities in a foetus?**

If there is any deformity in the Garbhotpadaka Beeja (ovum) or even in a part of the beeja it is carried onto the foetus i.e the fraction of the beeja affected creates deformity in the part which is formed by it. If there is no deformity in the beeja or beejabhaga the foetus thus formed is normal.

Congenital Abnormality - When a woman takes doshaprakopaka Aahar, the aggevated doshas spread in the body and may affect Rakta (blood) and Garbhashaya (uterus) but only partly. This can cause deformity in either the Matruja or Pitruj avayava. The affected part of the beeja or beejabhag caused due to aggrevation of the dosha creates deformity in that part of the organ or the organ itself.

**Congenital Abnormalities**

Pathophysiology of deformity in the foetus:

Doshaprakopak aahar taken by the pregnant female →

Spread of aggrevated of doshas in the body →

May affect Rakta and Garbhashaya but only partly →

Can cause deformity in either Matruja or Pitruj avayava →

Affected part of the the beeja or beejabhag caused due to aggrevation of the dosha creates deformity in that part of the organ or the organ itself.
Cell is a basic building block of all living things.

The human body is composed of trillions of cells. They provide structure for the body, take in nutrients from food, convert those nutrients into energy, and carry out specialized functions. Cells also contain the body’s hereditary material and can make copies of themselves.

Cells have many parts, each with a different function. Some of these parts, called organelles, are specialized structures that perform certain tasks within the cell. Each cell has a control center called nucleus. The nucleus contains the information that tells the cell what to do and when to grow and divide. This information comes in the form of genes, which are contained in chromosomes. In the nucleus of most human cells (except for sperm and egg cells), there are 23 pairs of chromosomes. Chromosomes are passed from parents to their children. One chromosome of each pair is inherited from the mother, and the other comes from the father. This is why children look like their parents, and why they may have at end encyclo develop certain diseases that run in their families.

With in each chromosome, there are many hundreds to thousands of genes. Genes and chromosomes are made up of long strands of a substance called DNA (deoxyribo nucleic acid). DNA, or deoxyribonucleic acid, is the hereditary material in humans and almost all other organisms. Nearly every cell in a person’s body has the same DNA. Human DNA consists of about 3 billion bases, and more than 99 percent of those bases are the same in all people. The order, or sequence, of these bases determines the information available for building and maintaining an organism. DNA, along with the instructions it contains, is passed from adult organisms to their offspring during reproduction.
Each gene is made up of a specific DNA sequence that contains the code (the instructions) for that gene's function. Genes tell the cell what to do.

Many genes tell the cell to make a certain protein that has a specific job or function in the body. Other genes help regulate how much protein another gene makes. Each human cell has about 25,000 genes.

A cell uses its genes selectively; that is, it can turn on (or activate) the genes it needs at the right moment and turn off other genes that it doesn't need. Turn in gon some genes and turning off others is how a cell becomes specialized. That is how a cell becomes a muscle cell and not a bone cell, for example. Some genes stay active all the time to make proteins needed for basic cell functions. Others shut down when their job is finished and start again later if needed.

**Genes, as the basic units of heredity, serve 2 major roles in cancers:**

**some are part of the development of cancer and others protect the body from cancer.**

**Genetic Mutations**

Each chromosome can contain hundreds or thousands of genes that are passed from the parents to the child. Every cell in the body has all of the genes you were born with. Although all cells have the same genes and chromosomes, different cells (or types of cells) may use different genes.

Genes are made up of DNA. The arrangement of the DNA bases determines the gene and its function. Mutations are gene defects. They are abnormal changes in the DNA of a gene. Mutations involve changes in the arrangement of the bases that makeup a gene. Even a change in just one base among the thousands of bases that makeup a gene can have a major effect.

A mutation can affect the cell in many ways. Some mutations stop a protein from being made at all. Others may change the protein that is made so that it no longer works the way it should or it may not even work at all. Some mutations may cause a gene to be turned on, and make more of the protein than usual. Some mutations don't have a noticeable effect, but others may lead to a disease. For
example, a certain mutation in the gene for hemoglobin causes the disease, sickle cell anemia.

Mutations can be Hereditary or Acquired.

**Hereditary mutations**

*Hereditary mutations* (also called *germline mutations*) are gene defects that are passed from a parent to child. Hereditary mutations are present in the egg or sperm that join during fertilization and develop into a fetus. Because the mutation is present at the beginning, it exists in all cells of the body, including reproductive cells (the cells that make sperm in males or the egg cells in females). This means the mutation can be passed from generation to generation.

A hereditary mutation is a major factor in about 5% to 10% of all cancers.

Some people are more likely to develop cancer than others simply because they are born with mutations in their genes.

**Acquired mutations**

Most cancers are caused by DNA changes that happen during the person's life. These are called *acquired, sporadic, or somatic mutations*. An acquired mutation can be caused by things in the environment such as exposure to radiation or toxins. But for most acquired mutations, no specific cause can be found.

Unlike the inherited mutations, acquired mutations start in one cell of the body and are found only in the offspring of that cell. They are not in every cell of the body. Because they are not in the reproductive cells, acquired mutations cannot be passed on to the next generation.

It is important to realize that mutations in our cells happen all the time. Usually, the cell detects the change and repairs it. If it can’t be repaired, the cell will get a signal telling it to die in a process called *apoptosis*. But if the cell doesn't die and the mutation is not repaired, it may lead to a person developing cancer. This is
more likely if the mutation affects a gene involved with cell division or a gene that normally causes a defective cell to die.

We have 2 copies of each gene (one from each chromosome in a pair). So, even when a person inherits a mutation, at least one more mutation is needed to "knock out" the other copy of that gene (so that it doesn't function). This acquired mutation is needed before a person develops a heredity-related cancer. Sometimes acquired mutations in other genes (such as oncogenes) are needed as well. For a person who is not born with a mutation, 2 acquired mutations (one in each copy of the same gene) are needed to knock out that gene.

**Role of Gene mutations in carcinogenesis**
The 2 main types of genes that play a role in cancer are oncogenes and tumor suppressor genes.

**Oncogenes**
Most oncogenes are mutations of certain normal genes called proto-oncogenes. Proto-onco genes are the "good" genes that normally control what kind of cell it is and how often it divides. When a proto-oncogene mutates (changes) into an oncogene, it becomes a "bad" gene that can become permanently turned on or activated when it is not supposed to be. When this happens, the cell grows out of control, which can lead to cancer.

A proto-oncogene normally helps the cell grow and divide. An oncogene causes the cell to divide out of control.

**Inherited mutations of oncogenes**
A few cancer syndromes are caused by in herited mutations of proto-oncogenes that cause the oncogene to be turned on (activated). For example, multiple endocrine neoplasia type 2 (MEN2) is caused by an inherited mutation in the gene called RET. People affected by this syndrome often develop an uncommon thyroid cancer called medullary cancer of the thyroid. They also develop other tumors, including pheochromocytoma and nerve tumors. Inherited mutations in the
gene called KIT can cause hereditary gastrointestinal stromal tumors (GISTs). And inherited mutations in the gene called MET can cause hereditary papillary renal cancer.

**Acquired mutations of oncogenes**

Most cancer-causing mutations involving oncogenes are acquired, not inherited. They generally activate oncogenes by chromosome rearrangements, gene duplication, or mutation. For example, a chromosome rearrangement can lead to formation of the gene called BCR-ABL, which leads to chronic myeloid leukemia (CML). Acquired mutations that activate the KIT gene cause most cases of gastrointestinal stromal tumor (GIST).

**Tumor suppressor genes**

Tumor suppressor genes are normal genes that slow down cell division, repair DNA mistakes, or tell cells when to die (a process known as apoptosis or programmed cell death). When tumor suppressor genes don't work properly, cells can grow out of control, which can lead to cancer. Many different tumor suppressor genes have been found, including TP53 (p53), BRCA1, BRCA2, APC, and RB1.

A tumor suppressor gene normally keeps the cell from dividing too quickly. When something goes wrong with the gene, such as a mutation, cell division can get out of control.

An important difference between oncogenes and tumor suppressor genes is that oncogenes result from the activation (turning on) of proto-oncogenes, but tumor suppressor genes cause cancer when they are inactivated (turned off).

**Inherited mutations of tumor suppressor genes**

BRCA1 and BRCA2 are human genes that produce proteins to help repair damaged DNA and, therefore, play a role in ensuring the stability of the cell’s genetic material. When either of these genes is mutated, or altered, such that its protein product is not made or does not function correctly, DNA damage may not be repaired properly. As a result, cells are more likely to develop additional genetic alterations that can lead to cancer.
Specific inherited mutations in \textit{BRCA1} and \textit{BRCA2} increase the risk of female breast and ovarian cancers, and they have been associated with increased risks of several additional types of cancer. Together, \textit{BRCA1} and \textit{BRCA2} mutations account for about 20 to 25 percent of hereditary breast cancers and about 5 to 10 percent of all breast cancers. In addition, mutations in \textit{BRCA1} and \textit{BRCA2} account for around 15 percent of ovarian cancers overall. Breast cancers associated with \textit{BRCA1} and \textit{BRCA2} mutations tend to develop at younger ages than sporadic breast cancers.

A harmful \textit{BRCA1} or \textit{BRCA2} mutation can be inherited from a person’s mother or father. Each child of a parent who carries a mutation in one of these genes has a 50 percent chance of inheriting the mutation. The effects of mutations in \textit{BRCA1} and \textit{BRCA2} are seen even when a person’s second copy of the gene is normal.

A woman’s lifetime risk of developing breast and/or ovarian cancer is greatly increased if she inherits a harmful mutation in \textit{BRCA1} or \textit{BRCA2}. About 12 percent of women in the general population will develop breast cancer sometime during their lives. By contrast, according to the most recent estimates, 55 to 65 percent of women who inherit a harmful \textit{BRCA1} mutation and around 45 percent of women who inherit a harmful \textit{BRCA2} mutation will develop breast cancer by age 70 years.

\textbf{Acquired mutations of tumor suppressor genes}

Tumorsuppressor gene mutations have been found in many cancers. Most of these mutations are acquired, not inherited. For example, abnormalities of the \textit{TP53} gene (which codes for the p53 protein) have been found in more than half of human cancers. Acquired mutations of this gene appear in a wide range of cancers, including lung, colorectal, and breast cancer. The p53 protein is involved in the pathway to apoptosis. This pathway is turned on when a cell has DNA damage that can't be repaired. If the gene for p53 is not working properly, cells with damaged DNA continue to grow and divide. Over time this can lead to cancer.

Acquired changes in many other tumorsuppressor genes also contribute to the development of sporadic (not inherited) cancers.
Use of oncogenes and tumor suppressor genes to prevent cancer

As mentioned before, some gene changes (mutations) can be inherited, which can increase your risk of developing cancer. Some mutations in oncogenes and tumor suppressor genes have been found often enough to be useful in helping decide which people are at higher risk for developing certain types of cancers.

A person who has family members with certain cancers known to be caused by genetic mutations, might find it helpful to know if he/she also has the mutation. Genetic testing can be used to look for such mutations.

In the genetic testing if a certain gene mutation is seen, some steps can be taken to minimize the risk. For example, women who carry a mutation in one of the BRCA genes have a high risk of getting breast cancer. These women are advised to start screening for breast cancer at a younger age and to consider screening with MRI along with mammography to help find breast cancer early. Some of these women even have surgery to lower their risk of cancer.

Use of oncogenes and tumor suppressor genes in guidance on treatment of cancer

In some cases, specific gene changes help predict which patients are likely to have a better or worse outlook or which patients are likely to benefit from certain treatments.

For example, HER2/neu is a proto-oncogene present in normal cells. It becomes an oncogene when a cell has too many copies of this gene. When this happens, the cells make too much HER2/neu protein. Many years ago, experts realized that patients with breast cancer with cells that have too much HER2/neu protein had a worse outcome than patients whose cancer cells have normal amounts. Cancers with too much of this protein did not respond as well to certain chemotherapy drugs, so now other drugs are used. Drugs were also designed to specifically attack cells with too much HER2/neu.
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