



ANGULI PRAMANA SHAAREERA W.S.R. TO SWA-ANGULA PRAMANA OF ANGA-PRATYANGA: A REVIEW

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ABSTRACT

Anguli pramana shaareera is based on the concept of *swa-angula pramana*. It has been given great importance in our classics due to the fact that it not only helps in measuring different parts of the body but also helps in assessing the life span, strength etc of the diseased (*aatura*) and also the healthy (*swastha*). *Angula pramana* concept has immense possibilities. Its utility can and should be explored in the field of sports, medicine etc. This article is an effort to revisit the *ayurveda* classics and examine the *angula pramanas* of different parts of the body mentioned to understand them better.

KEYWORDS: *Angula pramana shareera, Angula, Swa-angula pramana, Anthropometry.*

INTRODUCTION

Ayurveda is a science of life and it emphasizes on understanding the functional and structural constitution of the body. *Pramana shareera* is of great help in understanding the same. *Pramana* refers to the means of gaining knowledge in *Ayurveda*.^[1] It is also the means to quantitatively express the dimensions & other constituents of the human body.^[2] *Anguli pramana* is based upon *swa-angula pramana* and is used for measuring the *Ayama*(length), *vistara*(width), *parinaha*(circumference), *utsedha*(height) etc. of the different *anga-pratyangas* of the body. Different measurements of the body parts are taken by the using fingers breadth of the individual as unit measurement.^[3] *Angula pramana Shareera* plays a major role in determination of life span of a person. In *ayurveda* classics it is told that the person having appropriate measurements will attain long and a healthy life.^[4,5] *Acharyas* have explained the *pramana* of different *anga-pratyangas* of the body.^[6,7,8] *Anguli* is the unit measurement of the different *anga-pratyangas* of the body.^[9,10,11] In modern parlance, *pramana shareera* is correlated with anthropometry which is used only for physical measurement in order to assess height, age, sex etc.^[12,13] Whereas the concept of *pramana shareera* in *ayurveda* not only gives measurements of different body parts but also gives valuable information regarding life span of the person, strength etc.^[14,15] There are five types of *anguli- angushtha, pradeshini, madhyama, anamika* and *kanishthika*.^[16] One *angula* can be measured as: 1) Nakha tala bhaga of angushtha.^[17] 2) Width of the madhyama parva of the madhyama angula.^[18] 3) Measurement obtained by taking the length of the

madhyama angula and then dividing it by five.^[19] 4) Measurement obtained by taking width of the palm & then dividing by Four.^[20]

SWA-PRAMANA OF INDIVIDUAL PARTS^[21,22,23]

Padangushtha, Pradeshini, Madhyama, Anamika, Kanishthika- *Padangushtha* (great toe) and *pradeshini*(long toe) -2 angula length each; *madhyama* (middle toe)- 8/5 angula ayama; *anamika*-6/5 angula ayama; *kanishthika*-4/5 angula ayama. These pramanas to be measured from the metatarso-phalangeal crease on the plantar aspect to the tip of the toe.

Prapada- it is 4 angulas in ayama and 5 angulas in vistara. Ayama is to be measured from the posterior crease of the weight bearing part of the ball of the great toe to the tip of the great toe. The vistara is to be measured at the metatarsophalangeal joint while standing erect.^[24a]

Padatala- It is 4 angula in ayama and 5 angulas in vistara. It is to be considered from posterior crease of the weight bearing point of the ball of the great toe towards the heel. Vistara is to be measured from part of the foot close to the posterior crease of the weight bearing point of the ball of the great toe i.e. metatarsophalangeal joint while standing erect.^[24b]

Parshini- Its ayama is 5 angulas and vistara is 4 angulas. It is taken as the heel of the foot. It ayama is to be measured from the most backward projecting point of the heel(plantar) while the foot is sustaining the weight of the body^[25a] towards the toes and vistara at the middle of the heel.

Pada- Its *Ayama* is 14 *angula*, *vistara* is 6 *angulas*, *Utsedha* is 4 *angulas* *parinaha* is 14. *Ayama* is to be measured acropodion to the pternion.^[25b] *Vistara* is to be measured somewhere around the level of metatarsophalangeal joints.^[24c] *Parinaha* is to be measured at the middle of the *pada* (mid way between the ankle joint and ball of the foot). *Utsedha* is to be measured from the spherion to the floor in the natural standing position.^[26]

Jangha-Its *pramana* is given as 18 *angulas* in *Ayama* and 14 *angulas* in *parinaha*. The *Ayama* is to be measured from the highest but medial point of the medial condyle of the tibia to the Spherion.^[27] Its *parinaha* is to be measured at mid-level of the *Jangha*.

Janu- its *ayama* is mentioned as 4 *angulas*, *parinaha* 14 *angulas* by *sushruta* and 16 *angulas* by *charaka*. *parinaha* is to be taken from the *janu Madhya*. *Ayama* can be measured from the upper extent to the lower extent of the knee joint.

Janu uparishtat+Jangha- its *ayama* is 50 *angulas* as per *sushruta*. As per *Dalhana* measurement needs to be taken from lower extent of *janu sandhi* to the *kati sandhi* which will amount to 32 *angula* in length and then adding the length of the *jangha* to it.

Gulfa- Its *parinaha* is mentioned to be 14 *angulas* which is taken from *gulfa madhya*.

Uru- Its *Ayama* and *parinaha* are 18 and 32 *angulas* respectively by *sushruta*. Its *Ayama* is to be measured from anterior superior iliac spine(iliospinale) to the highest but medial point of the medial condyle of the tibia(tibiale).^[30] The *parinaha* is to be measured at level of the gluteal fold.

Angushtha, pradeshini, madhyama, anamika and kanishatika- Their *pramanas* are mentioned as $3^{1/2}$, $4^{1/2}$, 5, $4^{1/2}$ and $3^{1/2}$ *angulas* resp. This is to be measured from the roots of fingers in the palmar region to the tip of the fingers.

Prapani- Its *ayama* is 15 *angulas*. It is the forearm region. It is to be measured from radiale to stylium.^[32]

Pani- Its *Ayama* is mentioned as 12 *angulas*. It can be measured from the stylium to the dactylium.^[33]

Hastatala- *Ayama* and *vistara* are mentioned as 6 and 4 *angulas* respectively. It is to be measured from distal crease of the wrist to the root of the middle finger in the palmar region. Its *vistara* is to be measured between heads of 2nd -5th metacarpals at metacarpophalangeal joint.^[34]

Angushthamoola-pradeshini- It is 5 *angulas* in *ayama*. It is to be measured as the distance between the first metacarpo-phalangeal joint with the thumb extended and to the root of the index finger in the palmar region.

Hasta-Its *ayama* has been mentioned as 12 *angulas*. It can be measured from the stylium to dactylium.

Manibandha-koorpara sandhi- its *ayama* is 16 *angulas*. It is to be measured from wrist to elbow.

Prabahu- Its *Ayama* is mentioned as 16 *angulas*. It is to be measured from acromion to radiale.^[35]

Bhuja- Its *Ayama* has been mentioned as 32 *angulas*. It is to be considered as both the arm (brachium) and

forearm (antibrachium) together excluding the hand. This can be measured from acromion to stylium.

Skandha- Its *pramana* is as 8 *angulas*. It can be considered as the shoulder region measured from most lateral point of the acromion downwards and upwards towards the neck.

Kaksha- Its *pramana* is 8 *angulas*. It can be considered as the axillary region.

Amsa- Its *pramana* is 8 *angulas*. It can be considered as the scapula region. It is to be considered as the measure of the scapula. It is to be measured from the most projecting points of superior and inferior angles of scapula.^[36]

Manibandha- Its *parinaha* is mentioned as 12 *angulas*. It can be measured by using a measuring tape passing just proximal to the styloid process of ulna.^[37]

Prakoshtha- Its *parinaha* is mentioned to be 12 *angulas*. It is to be measured using a measuring tape passing 4 *angulas* above the manibandha,

Indrabasti- Its *angula pramana* is said to be 16 *angulas*.^[38]

Amsapitha-koorparantarayama- Its *Ayama* is mentioned as 16 *angulas*. It can be measured from most lateral point of the acromion process to the radiale.

Vrushana- Its *Ayama* is 2 *angulas*. It is the approximate length of the testis. So it seems that Acharya *sushruta* has taken it as testes.

Mehana (medra, shefa) - - Its *Ayama* has been mentioned as 4 *angula* by *sushruta*. It should be measured from the root of the penis to the tip. Acharya *vagbhata* has given the *parinaha* as 5 *angulas*. This is to be measured in erectile state and the level of the maximum circumference.

Bhaga- Its *pramana* has been mentioned as 12 *angula*.

Mehana- nabhi- Its *pramana* is 12 *angulas*. It is to be measured from root of the penis to the umbilicus.

Nabhi-hrudaya- Its *pramana* is 12 *angulas*. It is to be measured from the umbilicus to the level at around the xiphisternal joint.

Hrudaya- greeva- Its *pramana* is 12 *angulas*. It is to be measured from the level at around the xiphisternal joint to the suprasternal notch.

Purusha urah- Its *vistara* is 24 *angulas*. It is to be measured as the distance of the lateral aspect of the thorax at the level of the most lateral aspect at the level of 4th chondrosternal junction.^[39] Its *ayama* has been mentioned as 12 *angulas*. It can be measured from the xiphisternal joint to the suprasternal notch.

Bastishira- Its *ayama* has been mentioned as 10 *angulas*. it is to be measured from upper border of the pubic symphysis to the umbilicus.

Udara-Its *ayama* is mentioned as 12 *angulas* and *vistara* as 10 *angulas*. Its *ayama* can be calculated from umbilicus to xiphisternal joint and *Vistara* at the level of the umbilicus.

Parshwa- Its *ayama* and *vistara* are mentioned as 12 *angulas* and 10 *angulas* respectively. Its *ayama* can be taken from the sides of *vaksha*(chest) from below the axilla downwards and the *vistara* can be taken as the width of that *parshwa* region.

Purusha Kati- Its *vistara* is mentioned as 18 *angulas* by *sushruta* and 16 *angulas* by *vridha vagbhata* and *charaka*. It can be measured as the maximum distance between the lateral most lateral points of the iliac crest as felt through the skin^[40]

Stri urah- its *vistara* is 18 *angulas*. It is to be measured as the distance of the lateral aspect of the thorax at the most lateral aspect at the level of the 4th chondrosternal joint.

Hrudaya- *Pramana* of *hrudaya* is explained in *charaka samhita* and in *ashtanga sangraha* as 2 *angulas*.

Stana paryanta- Its *ayama* has been mentioned as 2 *angula*. It is the measure of the areola of the breast.

Stanantara- Its *pramana* is mentioned as 12 *angulas*. It is to be taken as the distance between the two nipples.

Trika- Its *Utsedha* is mentioned as 12 *angulas*. It extends from tip of the *gudasthi* to the *shroniphalaka*. It can be considered as the sacral region.

Prushtha- The *utsedha* of the *Prushtha* is mentioned to 18 *angulas* by *charaka* and *vagbhata*. It is to be considered from the nape of the neck to the level of the umbilicus which is around L3-L4 level.

Chibuka- *Acharya sushruta* has mentioned its *pramana* as 2 *angulas* which is to be measured from the margin laberale inferius to the gnathion. *Acharya charaka* and *vagbhata* on the other hand have explained its *pramana* as 4 *angulas*.

Dashana- *Sushruta* mentions its *ayama* as 2 *angulas*, 1 *angula* within the gums and 1 *angula* outside the gums.

Aanana- Its *parinaha* and *utsedha* are mentioned as 24 and 12 *angulas* respectively. The *utsedha* can be measured from the gnathion to the trichion.^[42a] While the *parinaha* is the circumference of the face.

Nasaputabhaga- Its *ayama* is 2 *angulas*. It is the measure of the alae of the nose.

Karnamoola- It is 2 *angulas* in *pramana*. It is the attachment of the ear with the head.

Bhruantara- It is 2 *angulas* in *vistara*. It is the distance between the two eyebrows.

Nayanantara- It is 2 *angulas* in *vistara*. It is the distance between inner canthi^[43]

Vadanantara- It is 4 *angulas* in *pramana*. It is the measure of the wide open mouth.

Nasavamsha- It is 4 *angulas* in *ayama*. It can be measured from nasion to the sub-nasal point.^[44]

Karna- It is 4 *angulas* in *pramana*. It can be considered as distance between the subaurale to supraurale^[45]

Lalata- It is 4 *angulas* in *pramana*. It can be measured from the hair line of the forehead (trichion) to the point at the intersection of frontonasal suture and the internasal suture in the median plane (nasion)^[46]

Greeva- It is 24 *angulas* in *parinaha* and 4 *angulas* in *ayama*. The *parinaha* can be measured immediately below the level of adam's Apple.^[47] The tape is placed perpendicular to the long axis of the neck.

Netra- The *pramana* of *netra* is 2 *angula*. It is the antero-posterior diameter of the eye.

Drushtyantara- It is 4 *angulas* in *vistara*. *Drushti* is the pupil area. The distance between the two pupils has to be considered here.^[48]

Drishhti- It can also be called as *drishti mandala*. *Sushruta* has mentioned the circumference(*parinaha*) of the *drishti* to be 1/9th of *tarka*.

Shravana-apangantara- It is 5 *angulas* in *pramana*. It is the distance between the external auditory meatus and the outer canthus of the eye.

Mukha- It is 12 *angulas* in *ayama* and 24 *angulas* in *parinaha*. The *ayama* is to be measured from the trichion to the tip of the gnathion.

Nasaputa maryada- It is 1^{1/3} *angulas* in *pramana*. It is the *pramana* of the *nasa* (nose) excluding the *tarunasthi* that is the width of the bony part of the nose.

Tarka- Iris of the eye is taken as *tarka* and its circumference is 1/3 of the circumference of *netra*.

Keshanta-mastakantara- It is 11 *angulas* in *pramana*. It has been considered as the distance between the hair line in the temporal region and whirls of the hair on top of the head(*Dalhana*).

Karna-avtu antara- It is 14 *angula* in *pramana*. It is the distance between the posterior attachments of the ears to the head.

Akshimadhya- It is 4 *angulas* in *vistara*. it is the distance between the two pupils of the eyes.

Shirodhara- Its *parinaha* is 24 *angulas* and its *utsedha* is 4 *angulas*.

Oshtha- Its *ayama* is 4 *angulas*. It is the *ayama* of both the upper and lower lips which is to be measured from sub nasal point to the gnathion.

Mastakat-avatukeshant- Its *ayama* is 10 *angulas*. It can be taken as the measurement from point of the whirls of hair on top of the head to the hairline at the back of the neck.

Shiras(head)-The *parinaha* and *utsedha* of the *shiras* is 32 *angulas* and 6 *angulas* respectively. *Parinaha* is measured by measuring tape by encircling it around the head covering glabella and opisthocranium. *Utsedh* is measured between the vertex and trigion^[49]

Ayama(height)- *Sushruta* has mentioned the height of man as 120 *angulas*^[50] *Charaka acharya* stated that height of the person to be 84 *angulas*.^[51] Similarly, *acharya vagbhata* also stated the optimum height to be 84 *angulas*.^[52]

DISCUSSION

Padangushtha (great toe) and **pradeshini**(long toe) explained by *sushruta* and *vruddha vagbhata* are said to be of 2 *angula* length (*ayama*) each. And it is further explained that the *madhyama* (middle toe) is fifth part less(*panchambhaga hina*) than *pradeshini* and similarly *anamika* is fifth part less than *madhyama* and *kanishtika* is fifth part less than *anamika*. The measurement of the toes should ideally be taken from the metatarso-phalangeal joint to the tip of the toe but the *pramana* mentioned in our classics seems to be measured from the metatarso-phalangeal crease on the plantar aspect to the tip of the toe. **Prapada** *pramana* has been mentioned by *acharya sushruta* and *Vagbhata*. There is a little difference of opinion regarding the *pramana* of *prapada* between the two. According to *sushruta* its *Ayama* and *vistara* are 4 & 5 respectively and *Vagbhata* has

mentioned them to be 4 & 6 *angulas* respectively. It is probably because of the different landmark chosen for measuring the *vistara*. *Acharya Sushruta* and *Vagbhata* have mentioned *Ayama* and *vistara* of **Padatata** as 4 & 5 *angulas* respectively. It is taken as the part of the sole of the foot in between the *prapada* and the *parshini*. The *vistara* is to be taken at the region where there is a possibility of getting the maximum measurement. There is a difference of opinion between *sushruta* and *vagbhata* about the *pramana* of **Parshini**, *Vagbhata* has mentioned the *ayama* and *vistara* as 4 and 4 *angulas* resp. it is probably because of the different landmarks used by the two. **Acropodian** is most forward and projecting point of the foot on the 1st or 2nd toe, whichever is longer. **Pternion** is the most posterior point of the heel while the foot is sustaining the weight of the body. **Spherion** is the lowest point of the medial malleolus of the tibia. **Jangha** is present between the *gulfa* and the *janu sandhi* i.e. leg region. The *parinaha* mentioned by *charaka* is 16 *angulas*. This difference of opinion is probably because of the different level taken by *charaka* to measure the *parinaha* i.e. the calf region where the calf muscles are most developed.^[28] **Janu** is correlated with knee joint. Difference of opinion b/w *Sushruta* and *charaka* regarding the *parinaha* probably is because *charaka* took the *parinaha* of *janu* closer to the thigh where as the *sushruta* took it at *janu* Madhya. **Kati sandhi** as explained by *parishadyam shabdarth shaareeram* is the hip joint but as per *dalhana ayama of uru* is equivalent to the *ayama of jangha* i.e. 18 *angula* and is calculated from upper extent of *janu sandhi* to *vankshan sandhi* which is also correlated with hip joint. So, to get the desired 32 *angula* *pramana* of **Janu uparishat+Jangha** from the lower extent of *janu* to *kati sandhi* the measurement needs to be taken from lower end of *janu* to the highest point of the iliac crest where the waist(*kati*) seems to be joining with the pelvis. **Gulfa** is the ankle. In anthropometry its circumference is taken just above the ankle bone.^[29] *Acharya charaka* and *Vagbhata* have mentioned the *pramana* of **Uru** *parinaha* as 30 *angulas*. It is probably because of the different level selected for measuring the *parinaha* of the *uru*(thigh). *Parinaha* can be measured by three different ways. For greatest circumference it is measured at about the gluteal fold, it can also be measured at the middle of the thigh and the least thigh circumference can be measured at just above the knee³¹. *Pramana of Prapani* is mentioned by *charaka* & *Vagbhata*. It can be measured from *radiale* to *stylium*. *Radiale* is the the highest point of the border of the head of the radius and *stylium* is the distal margin of the styloid process of the radius. **Pani** *pramana* has been mentioned by *Vagbhata*. *Dactylion* is tip of the middle finger without nail. **Hastatala** measurement is oblique and not transverse. Mostly the right hand is broader than the left. *Acharya sushruta* have given a different measurement for **Hasta** as 24 *angulas*. Difference is probably because *charaka* considered *hasta* from wrist to the tip of the middle finger whereas *sushruta* considered *hasta* from *koorpara* to the tip of the middle finger. **Manibandha-koorpara sandhi** is the region between

Manibandha and koorpara sandhi. Difference between *acharya charaka* and *vagbhata's* *prapani* measurement is probably because of the different level or landmark selected for measuring the *ayama*. **Prabahu** is considered as the brachium region i.e. between the shoulder and the elbow. *Acromion* is the lateral most point of the acromion process. **Bhuja** can also be measured first from most lateral point of acromion process to *radiale* then *radiale* to the *stylium* and then adding both. *Bahu moola* is considered as **Kaksha**. *Manibandha* is considered as the *panimoola* which can be considered as the wrist joint. **Prakoshtha** is also called *kalavike* by *dalhana*. **Indrabasti** is to be measured at the level of maximum circumference of the forearm i.e. just below the elbow joint. In *Amsapitha koorparantarayama* *pramana* *Amsapitha* is considered as *bahushira* which can be considered as the most lateral point of the acromion process. *Koorpara* is considered as the *bhuja madhya* which can be considered as the elbow joint. *Acharya charaka* and *vagbhata* have mentioned the *ayama* and *parinaha* of **Vrushana** as 6 and 8 *angulas* respectively. They have probably considered *vrushana* as *scrotum*. *Acharya vagbhata* and *charaka* have mentioned the *ayama* of **Mehana(medhra,shefa)** as 6 *angulas*. they took the measurement in *erectile* state and the measurement by *sushruta* to be in *non-erectile* state. **Bhaga** is to be measured by taking the circumference of the vulva. **Bastishira** is as the name suggests related to the *basti*. It can be correlated to the *urachus* which is a remnant of *allantois* which drains the urinary bladder of the fetus and runs within the *umbilical cord*. In *Parishadyam shabdarth shareeram* **Parshwa** has been explained as sides of the chest. **Kati** is said to be a region which is above the *medra*, *mushka* and *uru*. **Stri urah** is mentioned to be equal to the *purusha kati* i.e. 18 *angulas*. It is only correct to take **Hrudaya** in the context of the *pramana* *shaarira* as a region and not the organ. It can be taken a region of the *xiphoid process* where the heart rests on the *diaphragm*. Some also explains the *pramana* by taking it as the *pramana* of the valves or the apex of the heart. **Stanantara** is distance between the *sternum* and *nipple* can be a logical and consistent landmark to measure *Stanantara*. *Acharya charaka* and *vagbhata* probably gave the *vistara pramana* of the **Chibuka** where as *sushruta* gave the *ayama*. **Laberale inferius** is the median point in the lower margin of the lower membranous lip and **gnathion** is the lowest point on the lower border of mandible in the mid sagittal plane^[41] **Trichion** is the point where the anterior line of the hair on the forehead is cut by the *midsagittal plane* under normal circumstances^[44b] **Subaurale** is the lowest point and *superaurale* is the highest point of the external ear. *Acharya sushruta* has mentioned *pramana* of the **Netra** in *uttartantra* 1st chapter where he has given the antero-posterior measurement of the *netra* as 2 *angula*. In *uttartantra* 1st chapter he has mentioned the *ayama* of the **Drishiti** as 1/7th of the *ayama* of the *Krishna mandala*. Again in *uttartantra* chapter 7th he has quoted the *pramana* of *drishiti* to be equivalent to "masoor dal". *Vagbhata* has mentioned **Nasaputa maryada** *pramana* as

1/3 *angula*, which can be considered as the width of the nasal septum. Acharya Sushruta in *uttartantra* has also given the *ayama* of the of the **krishan mandala** as 1/3rd of the *ayama* of the *netra*. In **karna avatuantara** *pramana avatu* term has been explained in Amar kosha as elevation/prominence behind the neck. Acharya *sushruta's Drushtyantara* and *charaka's akshimadhy* are probably one and the same. Acharya *charaka* has mentioned **Shiras Utsedha** as 16 *angulas*. Though in *gangadhara tika* it has been mentioned it as 6 *angulas* in the original text itself. Even *chakrapani* commented it as 6 *angulas* only. He has further given the procedure to follow to measure the *Utsedha* of the *shiras*. He has explained that *utsedha* is to be measured from the posterior aspect and above the *greeva*. This can be inferred to as the junction of the head with the neck which is the occipital protuberance. Occipital protuberance marks the point superficially where the back of the neck joins with head (Gray's anatomy). So it can be further inferred that height of the head has to be measured from occipital protuberance according to *chakrapani*. A horizontal plane from the trignon is closely related to the occipital protuberance. *Dalhana* while commenting on **Ayama** of the person explained that the height given by *sushruta* is measured by making the person stand on his toes with his arms raised^{[50]*}. *Chakrapani* has commented that height is to be measured from *padatala* to *shirahparyanta* that is the top of the head.^[53]

CONCLUSION

Ayurveda, the science of life, has hidden within it the treasures of a long, healthy and a purposeful life which needs to be unearthed. And for that it is not only important for us to read and understand what is written in our *ayurveda classics* but we should also be willing to make ourselves competent enough to read between the lines and that is what our *Ayurvedacharyas* have directed us to do. Commentaries(*Tikas*) help us do just that. So, in this article the *angula pramana* of individual parts of the body was separately dealt with and explained and where ever it was required, help from the *tikas*(commentaries) was taken and at places anthropometry was also made use of. This would make the readers understand the topic better and with ease.

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