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

Dr. Amardeep Singh*
Lecturer, Dept. of Rachana Shaareera, Govt Ayurvedic College, Patiala, Punjab.

*Corresponding Author: Dr. Amardeep Singh
Lecturer, Dept. of Rachana Shaareera, Govt Ayurvedic College, Patiala, Punjab.
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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 (saatra) 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. It is also the means to quantitatively express the dimensions & other constituents of the human body. Anguli pramana is based upon swa-angula pramana and is used for measuring the Ayama(length), vistara(width), parinaha(circumference), utedha(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. 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. Acharyas have explained the pramana of different anga-pratyangas of the body. Anguli is the unit measurement of the different anga-pratyangas of the body.

SWA-PRAMANA OF INDIVIDUAL PARTS
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; canishthika-4/5 angula ayama. Theses pramanas to be measured from the metatarsophalangeal crease on the planter aspect to the tip of the toe.

Parpada- 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.

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.

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(pterion) while the foot is sustaining the weight of the body towards the toes and vistara at the middle of the heel.
**Pada**- Its Ayama is 14 angulas, vistara is 6 angulas. Utsedha is 4 angulas parinaha is 14. Ayama is to be measured acropedian to the ptternion. \[^{[280]}\] Vistara is to be measured somewhere around the level of metatarsophalangeal joints. \[^{[24]}\] 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 Spheron. \[^{[27]}\] 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 uparishat-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.

**Gulf**- 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).

**Angushthi, pradeshini, madhyama, anamika and kanishthika**- Their pramanas are mentioned as 3\[^{[3]}\], 4\[^{[12]}\], 5, 4\[^{[12]}\]and 3\[^{[12]}\] 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 styliion. \[^{[32]}\]

**Pani**- Its Ayama is mentioned as 12 angulas. It can be measured from the styliion to the dactyliion. \[^{[33]}\]

**Hostatata**- 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 palm region. Its vistara is to be measured between heads of 2\[^{[2]}\] -5\[^{[2]}\] 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 is to be measured from the styliion to dactyliion.

**Manibandha-korpara 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 styliion.

**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. \[^{[16]}\]

**Manibandha**- Its parinaha is mentioned as 12 angulas. It can be measured by using a measuring tape passing just proximal to the stylioid 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 scapula region.

**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 vyashbhas 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 of 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 4\[^{[2]}\]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.
Parusha Kati- Its vistara is mentioned as 18 angulas by sushruta and 16 angulas by vridhda 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 uruh- 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.

Trikha- 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 laterale 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.[42] 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.

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

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

Vadanatara- 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.[14]

Karna- It is 4 angulas in pramana. It can be considered as distance between the subaurale to superaurale.[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.

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

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

Shravana-aspangantara- 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 marayada- 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.[Daihuna].

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.

Mastakal-avatakeshant- 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 opisthocranion. Utsedha 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
Padangushthha (great toe) and pradeshini(long toe) explained by sushruta and vrudhda 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 hin) 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 metatarsophalangeal joint to the tip of the toe but the pramana mentioned in our classics seems to be measured from the metatarsophalangeal crease on the plantar aspect to the tip of the toe. Propada pramana has been mentioned by acharya sushruta and Vagbhata. There is a little difference of opinion regarding the pramana of propada 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 Padatala 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. Pterinion 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 gulfja 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. 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 parishadayam shabadartha shareeram 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 sandu to vankshan sandhi which is also correlated with hip joint. So, to get the desired 32 angula pramana of Janu upariishat=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. Gulfja is the ankle. In anthropometry its circumference is taken just above the ankle bone. 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 knee. Pramana of Prapani is mentioned by charaka & Vagbhata. It can be measured from radiale to styion. Radiale is the the highest point of the border of the head of the radius and styion 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 koopara to the tip of the middle finger. Manibandha-koopara sandhi is the region between Manibandha and koopara 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 styion and then adding both. Bahu mooola is considered as Kaksha. Manibandha is considered as the panimoola which can be considered as the wrist joint. Prakashtha 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 kooparantarayama pramana Amsapitha is considered as bahushira which can be considered as the most lateral point of the acromion process. Koopara is considered as the bhaja madhyad 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 i.e as the name suggests related to the basti. It can be correlated to the uracrus which is a remanant of allantois which drains the urinary bladder of the fetus and runs within the umbilical cord. Parishadayam shabadartha shareeram Parshwa has been explained as sides of the chest. Kati is said to be a region which is above the medra, mushika and uru. Suri 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 shairara 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 stanas 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 gnothon is the lowest point on the lower border of mandible in the mid sagittal plane. Trichion is the point where the anterior line of the hair on the forehead is cut by the midsagittal plane under normal circumstancess. 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 Drishhti as 1/7th of the ayama of the Krishna mandala. Again in uttartantra chapter 7th he has quoted the pramana of drishhiti to be equivalent to “masoor dal”. Vagbhata has mentioned Nasaputa marya 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 *krisan mandalas* as 1/3rd of the *ayama* of the neck. In *karna avatuanata* pramana *avatu* term has been explained in Amar kosha as elevation/prominence behind the neck. Acharya sushruta’s *Drushyantara* and charaka’s *akashimadhyaa* are probably one and the same. Acharya charaka has mentioned *Shiras Utsedha* as 16 angulas. Though in *gangadbara 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 protubrance. Occipital protubrance 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 protubrance according to *chakrapani*. A horizontal plane from the *tragion* is closely related to the occipital protubrance. *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\(^{120}\). *Chakrapani* has commented that height is to be measured from *padatala* to *shiraahparyanta* that is the top of the head.\(^{52}\)

**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.

**REFERENCES**


