

## A COMPREHENSIVE STUDY OF GUDA WITH SPECIAL REFERENCE TO GUDA-VALI

Dr. Mayank Sharma\*<sup>1</sup>, Prof. (Dr.) Renu Tripathi<sup>2</sup>, Dr. Ashok Kumar Dwivedi<sup>3</sup> and Dr. Mini K.V.<sup>4</sup>

<sup>1</sup>Research Scholar, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja, Uttar Pradesh.

<sup>2</sup>H.O.D., Dept. of Rachana Sharira, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja, Uttar Pradesh.

<sup>3</sup>Professor, Dept. of Rachana Sharira, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja, Uttar Pradesh.

<sup>4</sup>Associate Professor, Dept. of Rachana Sharira, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja, Uttar Pradesh.

**Corresponding Author: Dr. Mayank Sharma**

Research Scholar, Vaidya Yagya Dutt Sharma Ayurved Mahavidyalaya, Khurja, Uttar Pradesh.

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### ABSTRACT

*Guda* is a very important segment of the G.I. tract, present at its distal end, which serves the function of expulsion of the *Mala* and *Apana Vayu*, formed as residue after the metabolic transformation of the ingested food. *Guda* has been explained in many aspects like *Malashaya*, *Pureeshvaha Srotas*, *Pranayatana*, *Koshthanga*, place of *Mooladhar chakra*, *Bahya Srotas*, *Adhishtan* of *Apana Vaayu*, *Karmendriya*, etc. The concept of *Guda* has been beautifully explained both anatomically and functionally. Originating from the *Matraj Bhava*, *Guda* is described as *Uttar* and *Adhar Guda*, which, internally, comprises of three *Vali* – *Pravahani*, *Visarjani* and *Samvarani*. *Vali* refers to a fold or wrinkle. These *Vali* help in forcing the *Mala* downwards, relaxing the *Guda* for expulsion of *Mala* and contraction of the *Guda* after expulsion of *Mala*, respectively. *Guda* is also explained as an important *Marma*, categorized as a type of *Sadyopranahara Marma*, *Mamsa Marma* (according to *Sushruta*), *Dhamani Marma* (according to *Ashtanga Hridaya*) which is present in the *Madhya Sharir* and is of *Atma Paani tala* in *Pramaan*.

**KEYWORDS:** *Uttar Guda*, *Adhar Guda*, *Vali*, Defecation and Ano-rectal angle.

### INTRODUCTION

A healthy mind in a healthy body is the principal aim guiding all the prevailing systems of medicine. To achieve the longevity of life, several scholars have made efforts since so many years. All the time, *Ayurveda* has maintained the same trend of efforts.

A thorough knowledge of whole body is a must for a physician to fulfill the aims of *Ayurveda viz. Swasthya Rakshana* and *Vikara Prashaman*.

All the *Brihatrayees* opine the concept of *Sharir Shadangatva* and the science comprising of the description of structural aspect (constituency and formation) of a normal human body is *Rachana Sharira*. Similarly, the *Dosha*, *Dhatu* and *Mala* are considered as the basis of *Sharir*. Among these, the *Mala* include *Mutra*, *Pureesha* and *Sweda*. *Pureesha*, though meant to be expelled from body, is retained for some time before expulsion. There is a great anatomical and physiological basis explained in *Ayurveda* about this process all the way from formation till expulsion of *Mala*. This literary work is an effort to understand the

anatomical basis of *Guda*, which is the site of temporary storage and gradual expulsion of *Mala*.

Ano-rectal disorders are progressively increasing in the society. Out of many of the causes, some important ones are sedentary lifestyle, irregular and inappropriate diet, prolonged sitting or standing and certain psychological disturbances too. The fast food and cola-culture have again worsened the condition. All these factors produce disturbance in digestive system which result in many diseases; amongst them ano-rectal disorders like piles, fissure, fistula, prolapse etc. constitute an important group. Mostly, the ano-rectal disorders are coupled with psychological manifestations. This disorder is utterly embarrassing to the patient.

Patients concealing anal symptoms are significant in general practice despite the impact on quality of life. Anal examination is seldom done. Improved training of general practitioners is required to break the taboo.

### Importance of Present Study

In *Ayurvedic* texts, the information about *Guda* is not

condensed at one place, but is scattered among different chapters. This literary work is intended to gather the scattered information from different sources for better understanding about the concept of *Guda* and *Guda-Vali* that could be beneficial for its application in the practical field.

Based on the prevalence markers it is conclusive that patients often suffer severely from ano-rectal disorders either due to their shyness in disclosing the problem, missed diagnosis in absence of proper examination, poor prognosis, longer treatment duration and higher recurrence rates. Hence, the ano-rectal disorders should be taken into serious consideration. For positive results, a thorough knowledge of the basic concept of the *Guda* and *Guda-Vali* is needed.

## MATERIAL AND METHODOLOGY

**Materials** – *Brihatrayees, Kashyap Samhita, Ayurveda Shabd-kosha.*

**Methodology** – Collection of references, their critical examination and utilization to frame the conceptual part of the study related to *Guda* and *Guda-Vali*, followed by analysis of the collected facts with the contemporary science.

## DISCUSSION

The *Pakvashaya* and *Guda* are the *Anga-Pratyanga* of *Pureesh Vaha Srotas* and parts of *Mahasrotas*. *Anga-Pratyanga* is explained in different *Vedic* and *Samhita* periods.

## Synonyms of Guda

Acharya	Synonyms			
<i>Amarkosha</i>	Apana	Paayu	Guda	
<i>Jatadhara</i>	Guhya	Guda-vartma		
<i>Kalpadruma</i>	Apanam	Gudam	Shakrad-dwaram	Trivalikam
<i>Vachaspatyam</i>	Vit-marga	Paayu		
<i>Charak</i>	Uttar-Guda	Adhara-Guda	Sthoola-Guda	Paayu
<i>Sushruta</i>	Guda mandal	Guda valaya	Paayu-valaya	Guda -oshtha
<i>Vagbhatta</i>	Guda marga	Paayu		
<i>Dalhana</i>	Gudaantaram			
<i>Gangadhar</i>	Braghna			

Synonyms of *Vali* - According to *Shabda Sagar*, *Vali* refers to natural line or folds of skin, a wrinkle. Synonyms stated for *Vali* in *Kalpadruma* are *Charmataranga*, *Twak-taranga* & *Bali*

*Guda Utpatti* - *Acharya Sushruta* says that *Matraj Bhava* is *Mridu* in nature and hence the organs originating from *Matraj Bhava* are also *Mridu* viz. *Mamsa*, *Shonita* (*Rakta*), *Meda*, *Majja*, *Hridaya*, *Nabhi*, *Yakrut*, *Pleeha*, *Antra* and *Guda*.

According to *Sushruta*, all organs of the *Garbha* are in

## Nirukti of Guda

1) According to *Pratyaksha Sharir*,

“गूयते अनेनेति गुदम् तु मलोत्सर्गे”

i.e. the word *Guda* is derived from the root „Gu’ which means the structure which is filled with excreta and helps in removal of feces is *Guda*.

2) The word *Guda* is derived from

“गुद् क्रीडायाम् या तु मलोत्सर्गे ” (शब्दार्थ शारीरम्

by *Damodar Sharma Gaur*)

i.e. the body part which does the act of expulsion of feces is *Guda*.

3) According to *Ayurved Shabd-kosha*,

◆ “गोदते खेतते चालते वा अपान वायु अनेनेति गुदम्”

(by *Veni madhav shashtri publication, mumbai*)

i.e. the organ which helps in evacuation of *Apana Vayu* is *Guda*.

4) According to *Dhatupaath* and *Pratyaksha Sharira*,

“गुद् क्रीडायामेव”

(*Dhaatupaath, paanini, transliterated by Mihasa Bayaryn bayaryn updated @sanskritdocument.org*) i.e. *Guda* is the organ of sexual pleasure.

*Irukti of Vali*

“ वलिभिर्मुखमाक्रान्तम्” (Vin. ii, 112; Th. 2.256; J.

iv, 109)

*Vali* refers to a fold, wrinkle or ring. (Literary source include *Mahabharat* and *Kavya literature* as quoted in *Sanskrit dictionary.com*)

*Sookshma* form in the 3<sup>rd</sup> month of intrauterine life and these *Anga-Pratyanga* acquire appreciable form in the 4<sup>th</sup> month of the intrauterine life. Hence, it can be concluded that *Guda* also develops during 3<sup>rd</sup> and 4<sup>th</sup> month of intrauterine life. Explaining about the constitutional basis of *Guda*, *Acharya Sushruta* says that the *Prasad Bhaag* of *Rakta* and *Kapha* undergo *Pachan* by *Pitta* in presence of *Vayu* to give rise to *Antra*, *Guda* and *Basti Ashtanga Hridaya* also says that *Matraj Bhava* is *Mridu* in nature like *Rakta*, *Mamsa*, *Majja*, *Guda*, etc.

*Guda Pramana* - In *Ayurveda*, the concept of

measurement of length of body and body parts is studied under the heading of *Pramana Sharir*. The unit of measurement used for length is *Angula Pramana*, using one's own finger.

Describing about the site of occurrence of *Arsha*, in *Charak Samhita*, it is mentioned that the area of *Guda Pradesh* till *Guda Dwar* is the specific region for *Arsha* which measures  $4\frac{1}{2}$  *Angula* in dimension. Similar description is given by *Sushruta* that *Guda* is attached to the proximal part of *Sthoola Antra* and is *Ardha-Panchangula* in length. The *Pramana* of *Guda* as *Ardha-Panchangula* raises a conflict whether *Ardha-Panchangula* is either  $4\frac{1}{2}$  or  $5\frac{1}{2}$  *Angula*. In this context, it is quoted that *Ardha-Panchangula* is  $\frac{1}{2}$  *Angula* deduced from 5 *Angula*.

Citations of *Guda* - The various citations found in *Ayurvedic* texts about *Guda* are:-

1. *Adhi-Dev Guna* of *Paayu*
2. *Guda* as *Karmendriya*
3. *Guda* as *Pranayatana*
4. *Guda* as *Koshthanga*
5. *Guda* as *Bahi-Mukh Srotas*
6. *Guda* in the concept of *Srotas* and *Sroto-Moola*
7. *Guda* and *Pureesh-dhara Kala*
8. *Guda* as *Marma*
9. *Guda* in relation with *Moolaadhaar Chakra*

*Guda Varnana* - According to *Acharya Sushruta*, *Guda* is attached to the distal part of *Sthoola Antra*, and is *Ardha-Panchangula* in length. It comprises of 3 *Vali* namely, *Pravahani*, *Visarjani* and *Samvarani*, present at a difference of  $1\frac{1}{2}$  *Angula* each. The 3 *Vali* altogether are 4 *Angula* in length which emerge 1 *Angula* obliquely and appear one above the other resembling the whorls of a conch shell. Their color is similar to the palate of an elephant. *Gudoushtha* is  $1\frac{1}{2}$  *Yava* proximal to the hairy margin while, 1<sup>st</sup> *Vali* (*Samvarani*) is at a distance of 1 *Angula* from *Gudoushtha*.

According to *Acharya Vagbhata*, *Guda* is present as *Aashrit* in *Sthoola-Antra*.

Functioning of *Guda Vali* - The importance of *Vali* can be understood from the physiological activity managed by *Guda-Vali* which is explained in the *Vimarsh* of *Sushruta Samhita*, *Nidan Sthana*, Chapter 2, *Shloka* 6-8. The action claimed is as follows:-

1. 1<sup>st</sup> *Vali* - *Pravahani* is the 1<sup>st</sup> *Vali*, present proximally, which forces the *Mala* downwards.
2. 2<sup>nd</sup> *Vali* - *Visarjani* is the 2<sup>nd</sup> *Vali*, which relaxes the *Guda* for expulsion of *Mala*.
3. 3<sup>rd</sup> *Vali* - *Samvarani* is the 3<sup>rd</sup> *Vali*, present most distal among the 3 *Vali*, which contracts the *Guda*, is *Peshivat* and *Chakrakaar*.

Discussion on *Guda* Based on Measurement - Let us try to correlate the measurements of the rectum and anal canal in the view of *Ayurvedic* concept.

According to *Acharya Sushruta* and *Vagbhata*, the length of *Guda* is  $4\frac{1}{2}$  *Angula*. Also, it is stated that *Gudoushtha* is situated  $1\frac{1}{2}$  *Yava* proximal to *Romanta* and the distal most *Vali-Samvarani* is at 1 *Angula* distance from *Gudoushtha*.

*Dalhana*, while dealing with the above context, clarified that 3 *Yava* = 1 *Angula* length and specified that *Gudoushtha* is at a distance of about  $\frac{1}{2}$  *Angula* (one and a half *Yava*) from *Romanta*.

Findings based on a research on "A comparison of the usage of anal verge and dentate line in measuring distances within the rectum" suggests:-

1. The anal verge is the key in determining measurement based suitability for neo-adjuvant radio-therapy in rectal cancer.
2. The dentate line is a distinct anatomic landmark and may permit more accurate measurement for rectal lesions.
3. Based on the prospectively accrued results on patients undergoing colonoscopy and sigmoidoscopy, it was concluded that rectal valve anatomy is remarkably consistent.
4. Both, dentate line and anal verge are reliable landmarks from which distances can be measured within the rectum.

Comparing both - the *Ayurvedic* and the conventional aspects, it can be concluded that the *Romanta*, *Gudoushtha*, *Samvarani Vali*, anal verge and dentate line can definitely be used as the anatomic landmarks for the measurements of the structures in the region of *Guda*.

The measurement of one *Angula* is approximately 1.763 cm.

If we convert the measurements of *Angula Pramana* to modern measurement system in cms, then.

- The length of *Guda* =  $4\frac{1}{2}$  *Angula* =  $4\frac{1}{2} \times 1.763$  cm = 7.9335 cm  $\approx$  8cm
- Distance between *Gudoushtha* and *Romanta* =  $1\frac{1}{2}$  *Yava* =  $\frac{1}{2}$  *Angula* =  $\frac{1}{2} \times 1.763$ cm = 0.8815  $\approx$  0.89 cm
- Distance between *Samvarani* and *Gudoushtha* = 1 *Angula* = 1.763 cm

If we try to co-relate these measurements according to modern concepts, then,

- Hairy margin refers to the *Romanta* and anal verge refers to the *Gudoushtha*.
- Measuring from anal verge (*Gudoushtha*), 8cm lies at the level of 2<sup>nd</sup> Transverse Valves approximately. Hence, the *Guda* extends from the anal verge till the 2<sup>nd</sup> Transverse Valves.
- Length of anoderm\* is around 1.5cm from anal verge. (\*Anoderm is the lining of anal canal immediately inferior to the pectinate line and extending for about 1.5cms to anal verge, devoid of hair and sebaceous and sweat glands and so it is not

true skin.).

- Pectinate/ Dentate line lies at a distance of approximately 2.5-3cms from anal verge. This may be considered as the position of *Samvarani Vali* which is stated to lie at a distance of 1 *Angula* from *Gudoushtha*.

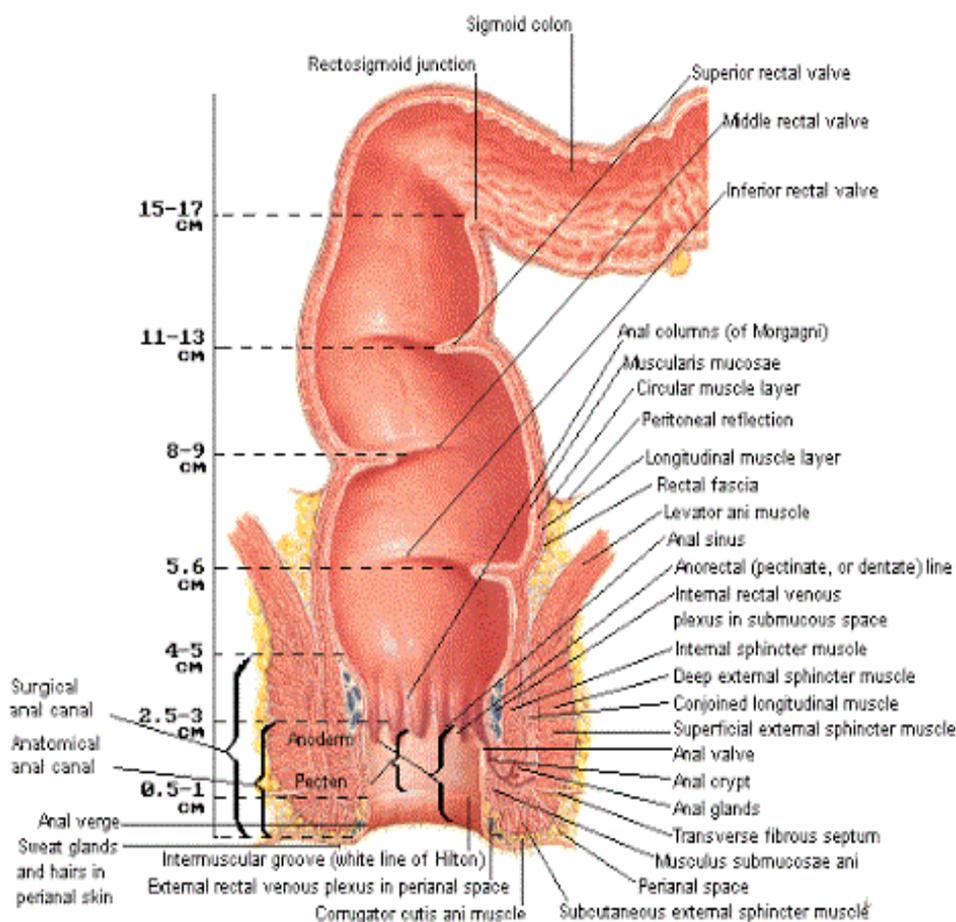
Discussion on Guda-Vali Based on Measurement - *Acharya Sushruta* has described that the interior of the *Guda* contains 3 *Vali* which need to be correlated to the modern anatomical parts. However, it becomes difficult to correlate exactly the 3 *Vali* with the modern concept.

According to *Acharya Sushruta* and *Vagbhatta*, there are 3 *Vali* present in the *Guda* viz. *Pravahani*, *Visarjani* and *Samvarani*, present at a distance of 1½ *Angula* each. Moreover, these are arranged obliquely to cover a distance of 4 *Angula* altogether. Also, the distal most

*Vali – Samvarani*, is at a distance of 1 *Angula* from *Gudoushtha*.

Based on the measurements discussed in the above section of the discussion on *Guda*, following inferences may be ruled out:-

- If *Samvarani Vali* lies in the region of the pectinate line, then *Visarjani Vali* should be 1½ *Angula* proximal to *Samvarani*, which approximates to 1½ x 1.763cm = 2.6445cm above the pectinate line. This relates to the region of inferior Houston's Valve. Also, this is the region of Anorectal ring, which is situated about 5cm from the anus.
- Similarly, 1½ *Angula* proximal to *Visarjani* is the *Pravahani Vali*, which approximates to the middle Houston's Valve (almost at the distance of 8-9cms from the anal verge).



A Diagrammatic representation of dimensions of the structures in ano-rectal canal

Discussion Based On Function Of Guda Vali - The functioning of the *Vali* are beautifully explained in the *Ayurvedic* texts which states that:-

- 1<sup>st</sup> *Vali*, *Pravahani*, present most proximally, forces the *Mala* downwards.
- 2<sup>nd</sup> *Vali*, *Visarjani*, relaxes the *Guda*.
- 3<sup>rd</sup> *Vali*, *Samvarani*, present most distally, contracts the *Guda*.

To understand and co-relate these processes in terms of modern anatomy, one must try to understand the process of defecation. Defecation is a complex process that involves:-

1. Mass peristaltic movements which push the fecal material from sigmoid colon into the rectum.
2. Distension of rectal wall.
3. Receptor and sensory nerve impulses to the sacral spinal cord.
4. Motor impulses along the parasympathetic nerves

to the descending colon, sigmoid colon, rectum and anus.

All the above stated processes result in contraction of the longitudinal rectal muscles which leads to shortening of the rectum, thereby, increasing the pressure within. This pressure accompanied with the voluntary contraction of the diaphragm and abdominal muscles along with the parasympathetic stimulation opens the internal anal sphincter. Simultaneous voluntary relaxation opens the external anal sphincter, thereby expelling the feces.

From the above explanation, it may be assumed that the process of pushing the feces into the rectum is the *Pravahan Karma*. The desire to defecate occurs only when the fecal matter enters the upper end of the rectal ampulla. Its beginning is marked by the presence of the middle Houston's valve, which is rich in stretch sensitive nerve endings. Similar to other viscera, colonic distension results in nondescript discomfort and at higher degrees of distention; one feels pain that is poorly localized. Rectal distention, however, is perceived as rectal fullness that is more localized and somewhat defined (as a desire to defecate). In addition to mucosal nerve endings, there are also low threshold, slowly adapting mechano-receptors in the muscularis propria of the rectum. These intraganglionic laminae endings detect mechanical deformation of the myenteric ganglia and are most likely involved in detecting tension in the circular and longitudinal muscles of the rectum. Hence, the structures present in the region of lower part of rectum, where the desire of defecation commences i.e. the upper end of the rectal ampulla/ middle Houston's valve must be co-related to the *Pravahani Vali*.

*Visarjani Vali* relaxes the *Guda*. This is the region of the inferior Houston's valve. The usage of the Houston's valve seems to be, "to support the weight of fecal matter, and prevents its urging toward the anus, where its presence always excites a sensation demanding fecal discharge." Also, Paterson utilizes the 3<sup>rd</sup> fold for the purpose of dividing the rectum into an upper and a lower portion. He considers the latter to be just as much a duct as the narrower anal canal below and maintains that under normal conditions, it does not contain feces except during the act of defecation. Hence, the *Visarjani Vali* may be co-related to Inferior Houston's valve.

Now, coming to the *Samvarani Vali*, this is said to be present 1 *Angula* proximal to the *Gudoushtha*. This *Vali* takes over the function of contraction of *Guda*. This is the region of anorectal ring which is formed by the fusion of the puborectalis muscle, external anal sphincter and the internal anal sphincter. While discussing the topic of Anorectal angle, it is known that the anal sphincters are responsible for the closure of the anal canal to retain gas and liquid stools. Also, we have known that the relaxation of the internal anal sphincter under the effect of parasympathetic stimulation and voluntary relaxation of the external anal sphincters,

accompanied with the relaxation of pelvic floor muscles causes the anorectal angle to become more obtuse i.e. 110 - 180° from its normal value of 90 - 100°, which in turn relaxes the anal canal for expulsion of feces through anus. Moreover, puborectalis muscle forms a U-shaped sling at the anorectal junction and forms the puborectal angle, which is designed to maintain the gross fecal continence. These structures, comprising of the sling formed by the fibers of puborectalis, the uppermost fibers of external anal sphincters and the internal anal sphincters are collectively called as the anorectal ring. Hence, the region of anorectal ring – which includes the puborectalis muscle, the external anal sphincter and the internal anal sphincter, may be assumed to form the *Samvarani Vali* which helps in constriction of the *Guda* to normal position after expulsion of *Mala*.

## CONCLUSION

The extent of *Guda* ranges from *Gudoushtha* till the termination of the *Sthoola Antra*. *Guda* can definitely be accepted as a *Karmendriya*, which serves the function of expulsion of *Mala* and *Apana Vayu* from the body. It can be accepted as a *Koshthanga*, comprising of two different entities viz. *Uttar Guda* and *Adhara Guda*. Among these, the proximally present *Uttar Guda* acts as temporary reservoir of the *Mala* while the distally present *Adhara Guda* assists in defecation. Hence, *Uttar Guda* can be co-related to the part of rectum from rectal ampulla (2<sup>nd</sup> transverse fold) till the inferior transverse fold while *Adhara Guda* can be co-related to the part below the inferior transverse fold till anal verge.

The three *Vali* – *Pravahani*, *Visarjani* and *Samvarani*, assist in the function of defecation by forcing the *Mala* downwards, relaxing the *Guda* and contracting the *Guda*, respectively. This concept of our great *Acharya* is appreciable and can be understood and co-related with the contemporary science. Hence, these three *Vali* can be co-related to the Middle transverse fold, Inferior transverse fold of the Rectum and the region of the Anorectal ring (comprising of the puborectalis muscle, the external anal sphincter and the internal anal sphincter), respectively.

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