

## Urethral Length in North-Indian Adult Male Population

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### Introduction and Objective

Per urethral interventions are so commonly performed procedures in any urology clinic in our country but surprisingly there is no population-based data available regarding normal male urethral length [1]. Scanty literature from the West has been the reference backbone till today and there is no database available from India [1]. Hence, we are presently using the devices designed for the Western population [3]. Catheters are at least more than 1½ times the average length of the urethra, indicating a need to perhaps customize the catheter and instruments for our population. Urologists are still comfortable doing calibration/dilation for treatment of urethral stricture disease. Hence, it is very important to know the normal urethral length and the stretched penile urethral length to estimate the stricture location within the urethra.

### Materials and Methods

From January 2013 to June 2013, 200 admitted adult male patients who required catheterization as part of regular treatment were taken as study subjects. Patient consent and ethics review board clearance was obtained. Patients with urethral abnormalities were excluded. No. 16F Foley's catheter has been used as the standard for the measuring purpose. Its balloon was inflated using 10 cc of saline. The length from the junction of the balloon to the 'Y' junction of the Foley was measured. The catheter was then passed into the bladder and reinflated to same volume. The penis was gently straightened and the length of the catheter outside the penis (external urethral meatus) was measured till the 'Y' junction. Subtracting this from the original catheter length gave the measured length of the urethra. Stretched penile length was also measured from symphysis pubis in every patient.

### Procedure

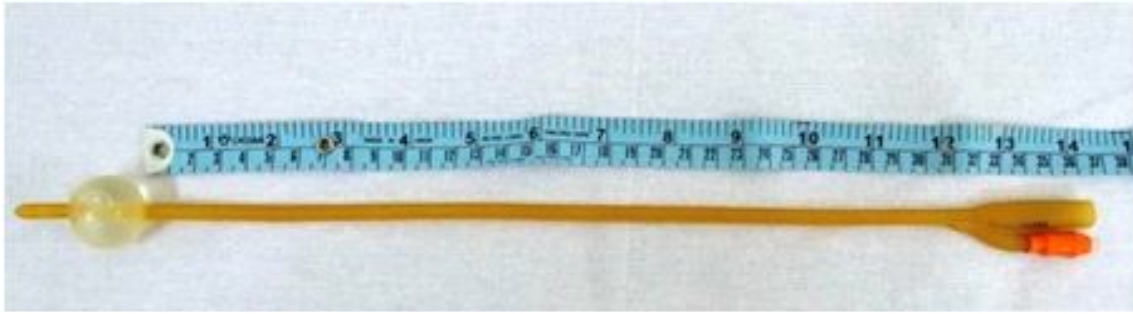
16F Foley Catheter



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Foley balloon inflated with 10cc saline



Catheterized patient.



Urethral length- flaccid penis



Urethral length- stretched penis



Stretched penile length



**Data analysis and Result**

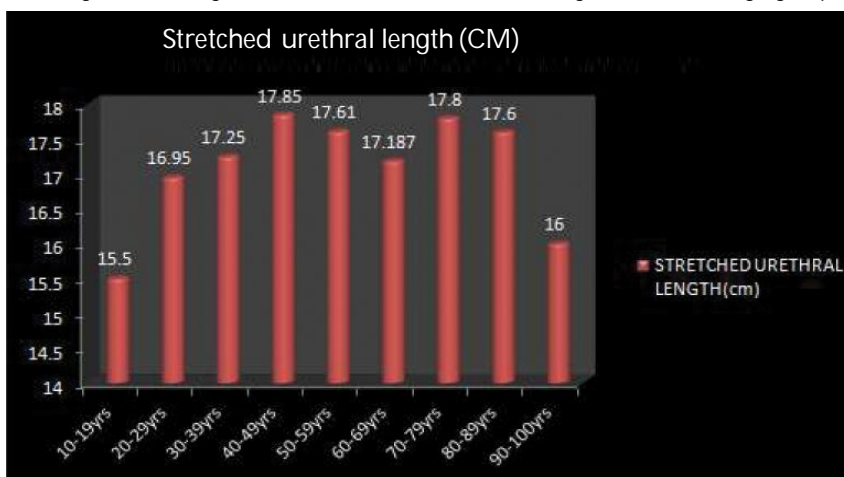
Data was collected between January 2013 to June 2013. Data analysis was done on completion. 200 male patients were in the study group. They were of age range 17-90 years, mean age group was 54.51 years. First, the length of the urethra was calculated with penis in the flaccid phase (mean length-15.459cm, SD-1.541), then the penis was put on gentle stretch and the urethral length was again

measured (mean length-17.392cm, SD-1.7). The range of stretched urethra was 15-21.3 cm and the maximum urethral length was measured in the age group 70-79 years. Next, the stretched penile length was measured from pubic symphysis to tip of the glans penis (mean length- 10.553, SD-1.2, range- 8-14cm). The maximum penile length was seen in the age group 17-39years. The statistical analysis has been shown in appropriate chart and graphs.

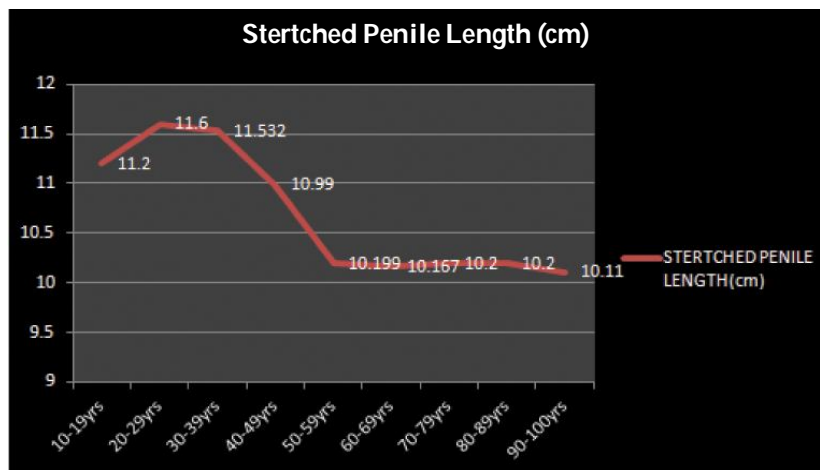
Stretched urethral length and stretched penile length according to the age group

Age Group (yrs)	Mean Urethral Length (cm)	Mean Penile Length (cm)
10-19	15.5	11.2
20-29	16.95	11.6
30-39	17.25	11.532
40-49	17.85	10.99
50-53	17.61	10.189
60-69	17.18	10.167
70-79	17.8	10.2
80-89	17.6	10.2
90-100	16	10.11

Bar diagram showing normal distribution of urethral length in different age groups



Line diagram showing normal distribution of penile length in respective age groups



## Discussion

The length of male urethra is what we get to know from the western literature [1,2,3]. We are presently using the catheters and other urethral devices designed for the Western population. Therefore the Foley's catheters that we take into use are actually meant for the western population. The full length of a Foley's catheter is 40cm and the 'useful length' is 30 cm.

Urologists must have a good knowledge of the normal male urethral length. It becomes essential to estimate the level of the urethral stricture from a RGU film and to utilize the same while calibrating/sounding of the male urethra [1]. We would also like to attach the importance about the knowledge of stretched penile length. While doing urethral calibration or a RGU film we always put the penis under 'stretch' and that is why to estimate the level of the stricture down the line we should have an exact idea about the stretched urethral length [5, 6].

The various means of measuring male urethral length are: retrograde urethrogram and micturating cystourethrogram, magnetic resonance imaging (MRI) and flexible cystoscopy [2, 4]. However, all of these methods require adequate expertise and instruments. So, measuring the male urethral length using a Foley's catheter is much simpler and cost effective.

The mean urethral length was found to be (17.392cm, SD-1.7) in our sub-population and the range of stretched urethra was 15-21.3cm.

The variation in urethral length has been largely attributed to differences in penile and prostatic urethral lengths. The length of prostatic urethra ranges from 2.5–4.5 cm as per the published data. Age-related prostatic hypertrophy is expected to result in an increase in overall urethral length (as seen in the age group 70-89years, in our study). But it is probably counter balanced by the possible age-related atrophy of periurethral tissues. Similar is the case with penile urethra as seen in our study, there is a decrease in the length of stretched penis after 55years of age. Therefore the difference in the overall urethral length is only minimal in this older age group.

The length of the catheter that we use (40cm) is almost twice the length of male urethral length in our sub-population (range 15-21.3cm). This indicates a need to perhaps customize the catheter and instruments for our sub-population. Also there seems no basis putting these long catheters in female subjects where the urethral length is only 3-4 cm. Thus a decrease in the size of the urethral catheters and instruments is likely and this would bring down the production cost for the same which will be beneficial to both the manufacturers and consumers.

## Conclusion

There is hardly any data regarding the male urethral length in Indian population. Therefore there is a need to build up a strong database on male urethral length in our country. This data would help to devise instruments and catheters suitable for Indian sub-populations, in the future.

## References

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