

## Background

- Shigemura et al. found that a shorter duration (14 days) of stenting resulted in fewer adverse events after stent removal. However, the range of days that the ureteral stent was left in place ranged from 3-61 days.
- Current AUA guidelines recommended three to seven days duration of ureteral stenting following routine, uncomplicated ureteroscopic stone intervention.
- Hypothesis: Ureteral stent removal at 3 as compared to 7 days postoperatively will improve quality of life** without increasing their risk of negative side effects.

## Objectives

As per the American Urological Association (AUA) Endourological Society Guideline (YEAR), there is no clear delineation regarding timing for ureteral stent placement after ureteroscopy and three to seven days only recommended in the setting of routine, uncomplicated stone intervention. The aim of this study is to determine whether patients would have improved symptoms with a shorter duration of stent placement without negative impact.

## Methods

A total of 102 patients were randomized to two groups, either a 3 day (N=61, Group 1) or 7 day (N=41, Group 2) stent placement group depending on date of surgery. Patients submitted the validated Ureteral Stent Symptom Questionnaires (USSQ) both while stents were in situ and 1 week after removal. The USSQ use 5 point Likert scale responses. The same patients responded to the survey while stents were in situ and after removal. All patients in this series underwent uncomplicated ureteroscopy and stent placement. All cases used access sheaths. All stents were left on a string. All patients received the same postoperative medications.

Background	Patient Characteristics	n, (n%)
	Total Patients	n = 102
Age	Range	23-74
Gender	Male	51 (50)
	Female	51 (50)
Ethnicity	Caucasian	65 (64)
	African American	28 (27)
	Asian American	3 (3)
	Hispanic	4 (4)
Stent Duration	3 days	61 (60)
	7 days	41 (40)
Previous Stone Surgery	Yes	36 (35)
	No	66 (65)
Stent Size	6x22	8 (8)
	6x24	54 (53)
	6x26	37 (36)
	6x28	3 (3)

## Analysis

The results prompted several inquiries:

- Are overall symptoms worse for Group 1 or Group 2?
- Are in-situ symptoms worse?
- Are symptoms worse after stent removal?

The USSQ measured four constructs: urinary symptoms, pain, daily functioning, work functioning, and sexual function. Using paired 2-tailed t-tests, we compared the USSQ results for the Groups 1 and 2. For data analysis, SAS (version 9.4, Cary, NC) was used with p<.05 considered significant.

We used random effects mixed models to test the group effect, adjusted for time, the time effect adjusted for group, and the group by time interaction, which tells us whether the time effect differed by group. This adjusts for within-subject auto-correlation since each patient was measured at two times: in situ and post. We also tested whether there were group effects within time periods using 2-tailed t-tests, and whether there were time effects within group, using paired 2-tailed t-tests. SAS (version 9.4, Cary, NC) was used for data analysis with p<0.05 considered significant.

## Results

Intensity of urinary symptoms dropped significantly after stents were removed for both groups (p<0.0001). During the in situ time point, Group 2 had more severe urinary symptoms than Group 1 (p=0.02). Both groups had large drops in pain levels after stents were removed (p<0.0001). Pain was significantly higher in Group 2 than Group 1 during both the in situ and post time periods (p=0.005 and 0.008). Daily functioning improved after stent removal for both groups (p<0.0001 ). The improved daily functioning for Group 1 over Group 2 was true at both in situ (p=0.002) and after stent removal(p=0.002).

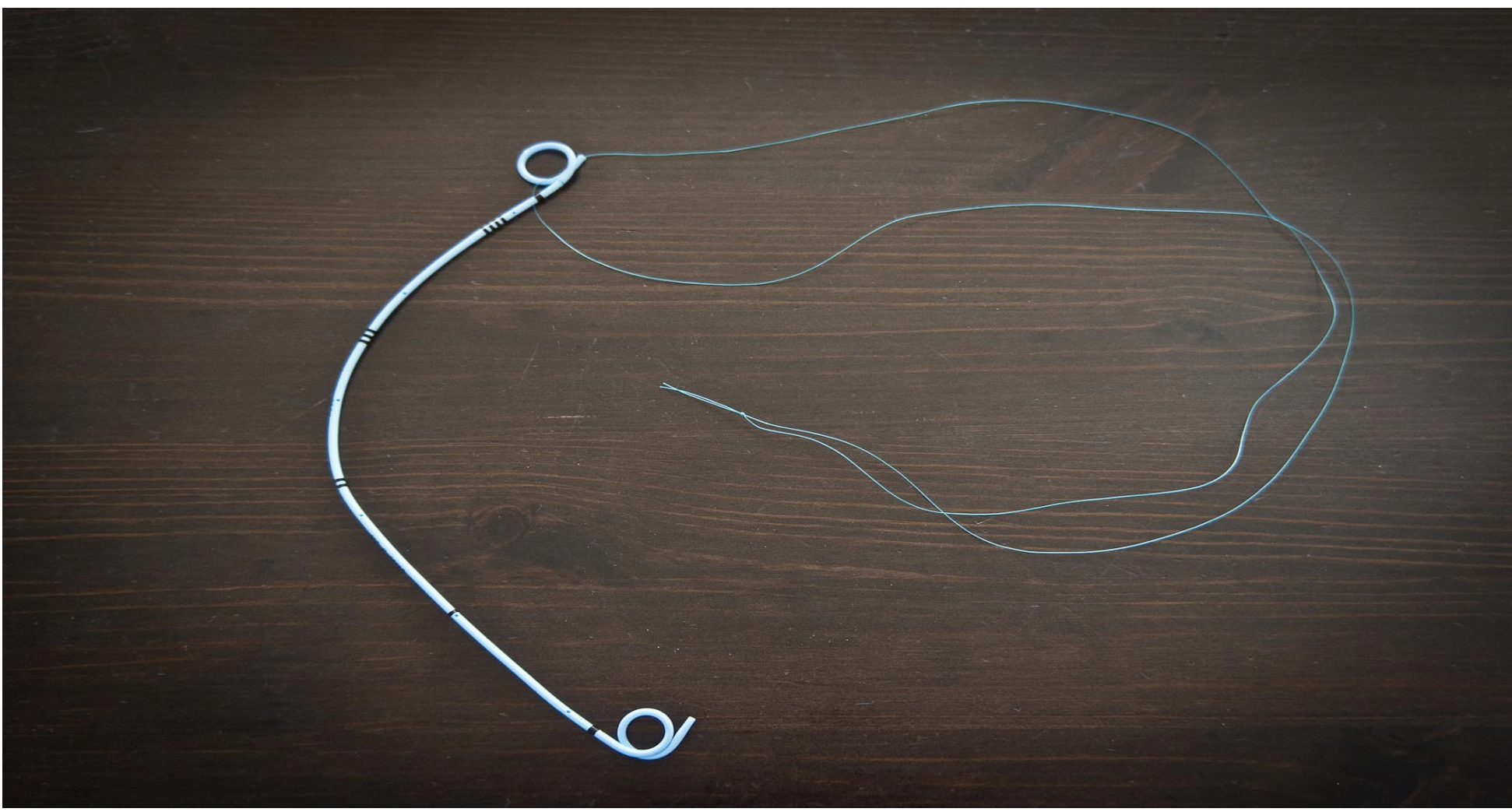
There were no significant differences in work-related functioning between groups both stent-in situ and after removal. Of note, there were no complications requiring office visits, emergency department visits or hospital readmissions.

Adjusted means with 95% confidence intervals by group and time.

	Group 1	Group 1	Group 2	Group 2
Variable	In situ	Post	In situ	Post
Urinary symptoms	2.6 (2.4-2.9)	1.8 (1.5-2.0)	3.1 (2.8-3.4)	2.4 (2.1-2.7)
Pain	2.5 (2.1-2.8)	1.3 (0.9-1.6)	3.1 (2.7-3.6)	2.0 (1.6-2.5)
Daily (Low) functioning	2.7 (2.4-2.9)	1.6 (1.3-1.8)	3.3 (3.0-3.6)	2.4 (2.1-2.7)
Work functioning	2.0 (0.9-3.1)	1.2 (0.2-2.3)	2.6 (1.3-4.0)	3.2 (1.8-4.5)
S3 (pain during sex)	1.1 (0-2.6)	1.2 (0.1-2.2)	2.5 (0.8-4.1)	2.0 (0.7-3.3)
S4 (Sexual Satisfaction)	1.8 (0.3-3.2)	2.0 (1.1-2.9)	2.2 (0.6-3.8)	2.4 (1.3-3.5)

## Conclusion

- Our study suggests consideration of ureteral stent removal 3 days after uncomplicated ureteroscopy.



Stent removed in office after three days

### References

Ordonez, M., Borofsky, M., Bakker, C. J., & Dahm, P. (2017). Ureteral stent versus no ureteral stent for ureteroscopy in the management of renal and ureteral calculi. *Cochrane Database of Systematic Reviews*.

Lingeman JE, Preminger GM, Goldfischer ER, Krambeck AE; Comfort Study Team.. Assessing the impact of ureteral stent design on patient comfort. J Urol. 2009 Jun;181(6):2581-7.

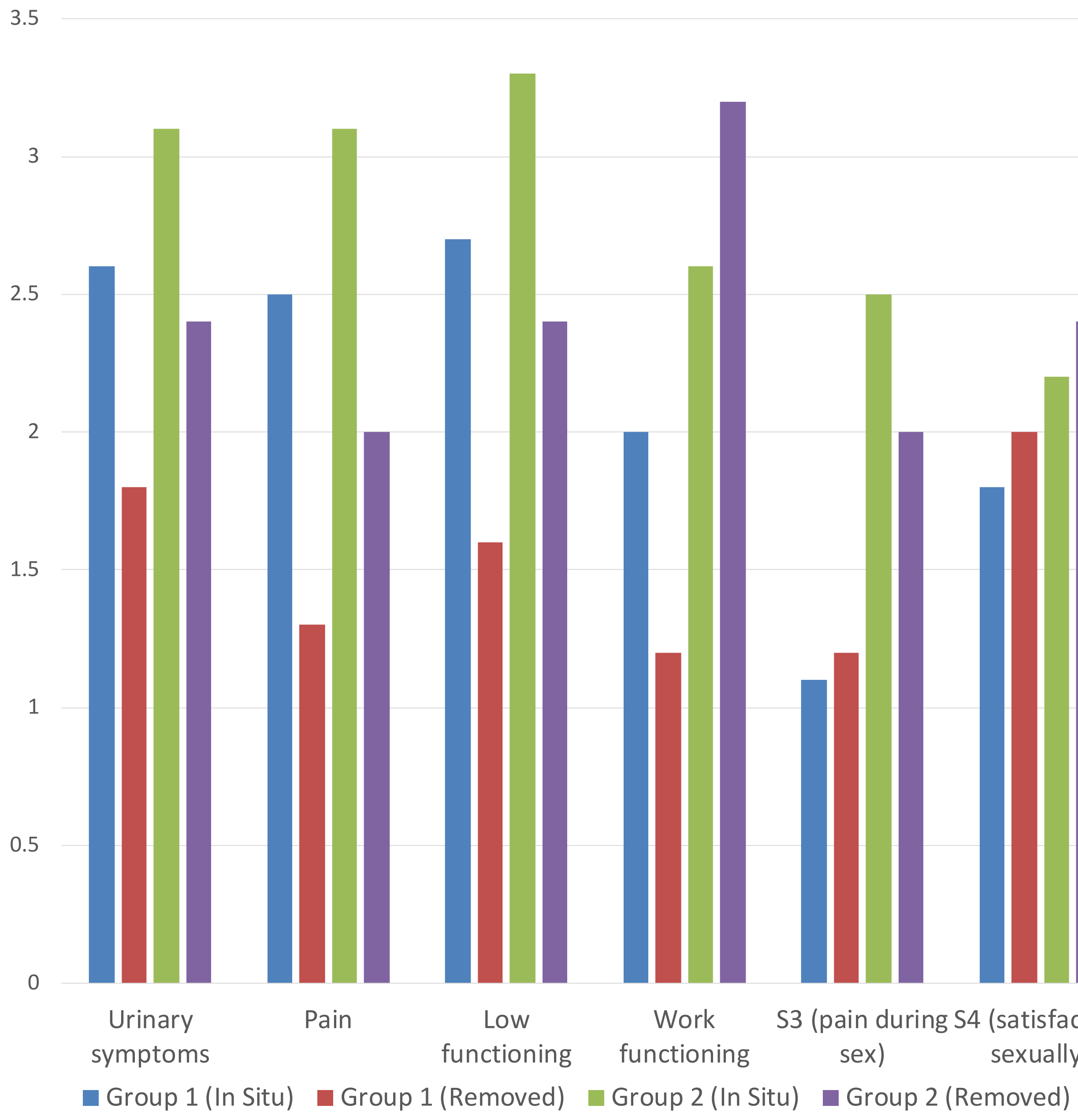
Shigemura K, Yasufuku T, Yamanaka K, Yamahsita M, Arakawa S, Fujisawa M. How long should double J stent be kept in after ureteroscopic lithotripsy? Urol Res. 2012 Aug;40(4):373-6.

Torricelli, F. C., De, S., Hinck, B., Noble, M., & Monga, M. (2014). Flexible Ureteroscopy With a Ureteral Access Sheath: When to Stent? *Urology*, 83(2), 278–281. doi: 10.1016/j.urology.2013.10.002

### Acknowledgements

Appreciate support from GW Hospital and Sibley Memorial Hospital

Comparing Stent Related Symptoms for 3 days vs 7 days



Patients in Group 2 have more urinary symptoms (p<0.0001), pain (p=0.005), worse daily functioning (p=0.002) with stent in place. Pain (p= 0.008) and worse daily functioning (p=0.002) was more significant in Group 2 after stent removal as well.