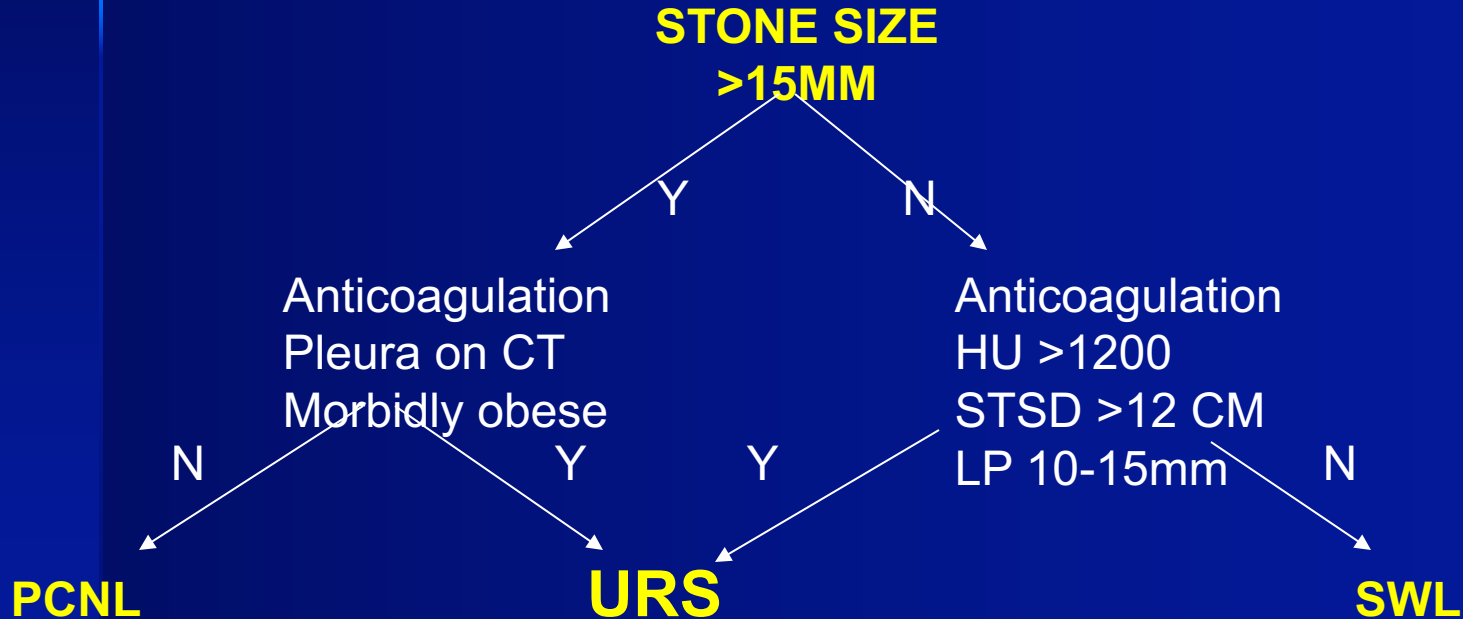


CONTROVERSIES IN PCNL

Antibiotics
Endoscopic-guided access
Prone Position
Upper calyx puncture
Single puncture
Maxi-Perc
Tubeless

PCNL FOR RENAL STONES: WHEN?



Anatomical considerations favoring PCNL

- Infundibular stenosis
- Calyceal tic
- Horseshoe / Pelvic / Ectopic
- UPJO
- Urethral stricture
- BPH
- Ureteral stricture

Percutaneous Nephrolithotomy (PCNL)

4 of 1000 patients DIE from PCNL

**WHY?
Sepsis**

J Urol 2013 Aug;190(2):558-64.

SEPSIS after PCNL and URS

- LIJ
- Preoperative predictors of sepsis after PCNL and URS
 - bladder outlet obstruction (OR 6.4)
 - positive pre-operative urine culture (OR 6.7)
 - indwelling nephrostomy tube (OR 6.4).
- Treatment of a positive preoperative urine culture did not reduce the risk of sepsis, and cannot be considered a reliable preventative measure.

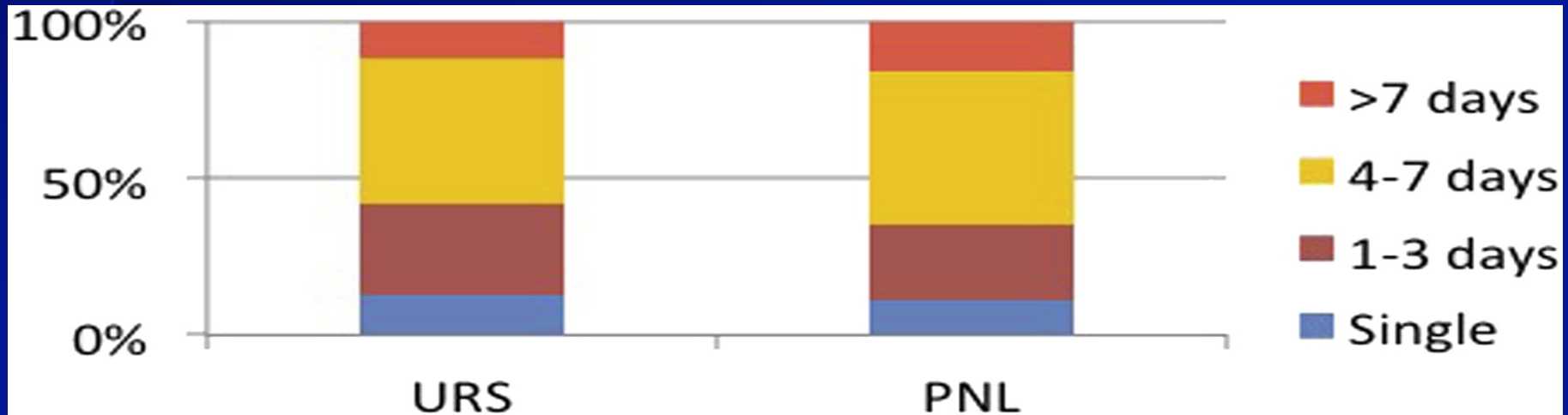
Stone / Pelvis Culture

- 37% of pts – SIRS after PCNL
 - 4x higher risk if positive stone culture or positive pelvis aspirate
 - Bladder culture not predictive
 - J Urol. 2005 May;173(5):1610-4.

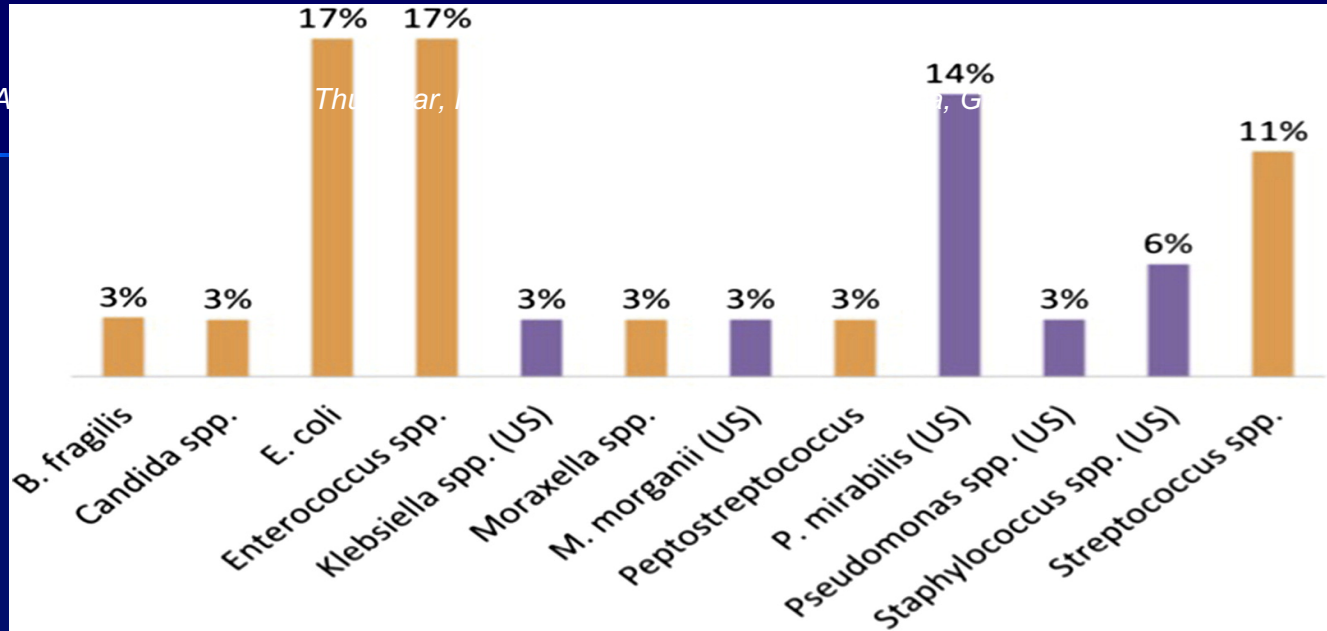
MP20-14 ANTIMICROBIAL UTILIZATION PRIOR TO ENDOUROLOGICAL SURGERY FOR UROLITHIASIS: ENDOUROLOGICAL SOCIETY SURVEY RESULTS

Adam Kaplan

The Journal of Urology
Volume 193, Issue 4, (April 2015)
DOI: 10.1016/j.juro.2015.02.986



MP38-05 THE MODERN ERA STRUVITE STONE: PATTERNS OF URINARY INFECTION AND COLONIZATION



STRUVITE STONES:

Positive Urine Culture for Urea-splitting organism

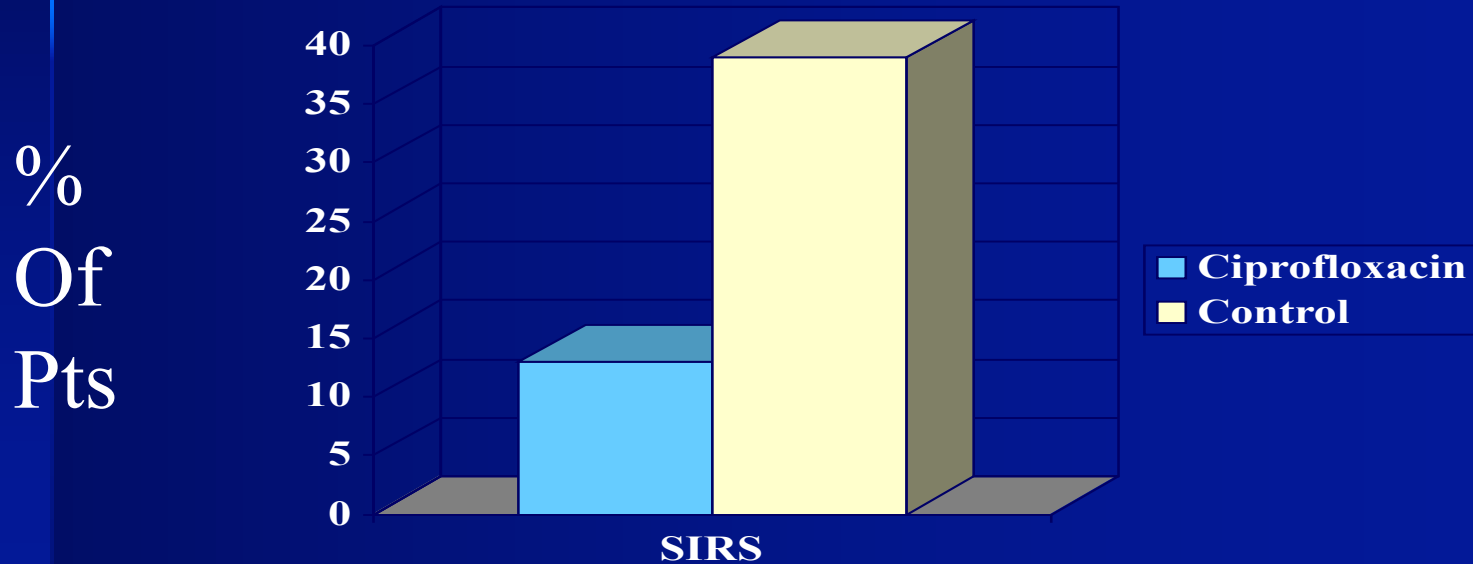
Preop 31%

12 months 58%

Positive stone culture 69%

Urea-splitting organism 29%

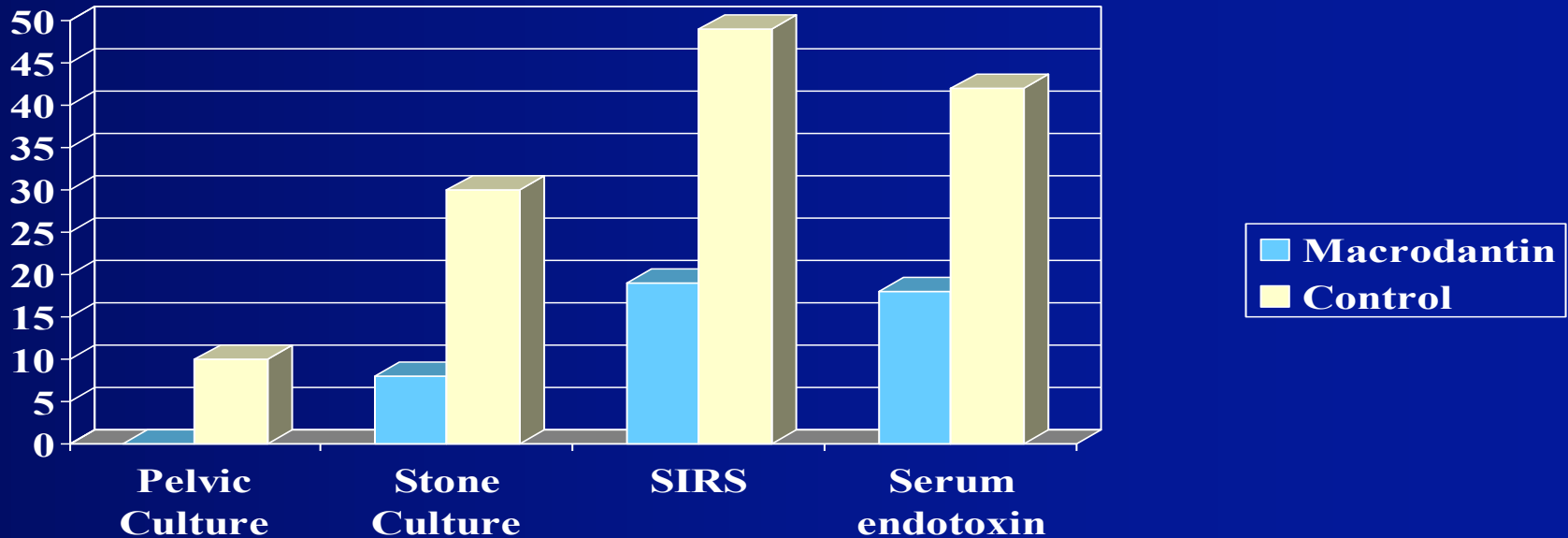
Non-RCT – Ciprofloxacin 250 BID x 7 days



BJU Int. 2006 Nov;98(5):1075-9.

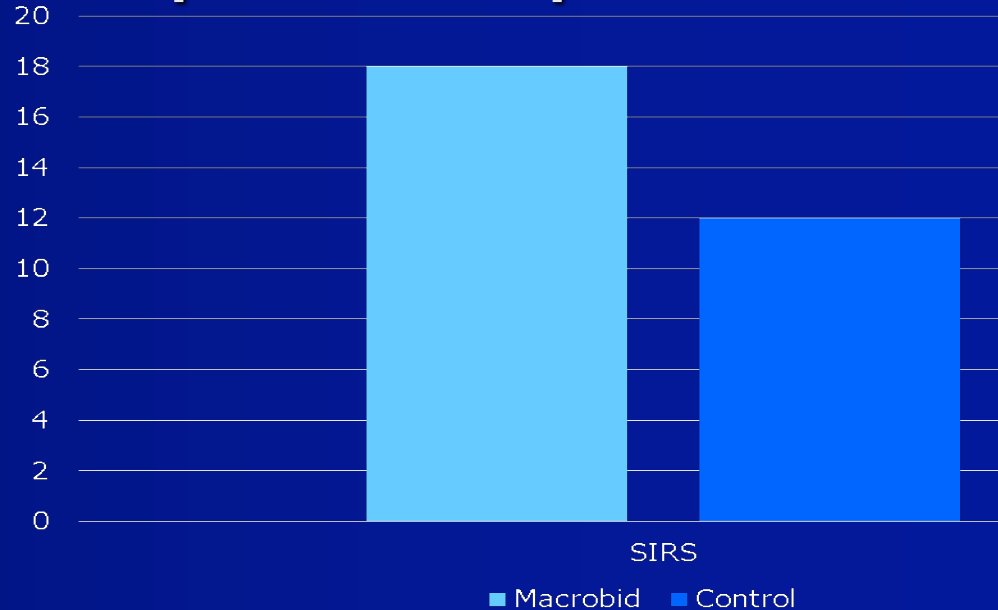
RCT – Macrodonatin 100mg BID x 7 days

%
Of
Pts



PD35-03: A Randomized Control Trial of Preoperative Prophylactic Antibiotics Prior to Percutaneous Nephrolithotomy in the Low Risk Population: A Report from the EDGE Consortium.

- **1 wk Nitrofurantoin vs 24h (34 pts per arm)**
- **No advantage 1wk abx in low risk pts**
- **< 24 hr peri-operative abx as per AUA Best Practice Statement sufficient**



Antibiotic Options

- Follow the guidelines
- **Individualize approach**
 - 1 week for:
 - Recurrent UTIs
 - Indwelling catheters
 - Neurogenic Bladders
 - Pyuria
 - Struvite
- Treat everyone with 1 week of antibiotics

Prone Split-Leg Position



Anesthesia

X-ray
monitor

C-arm

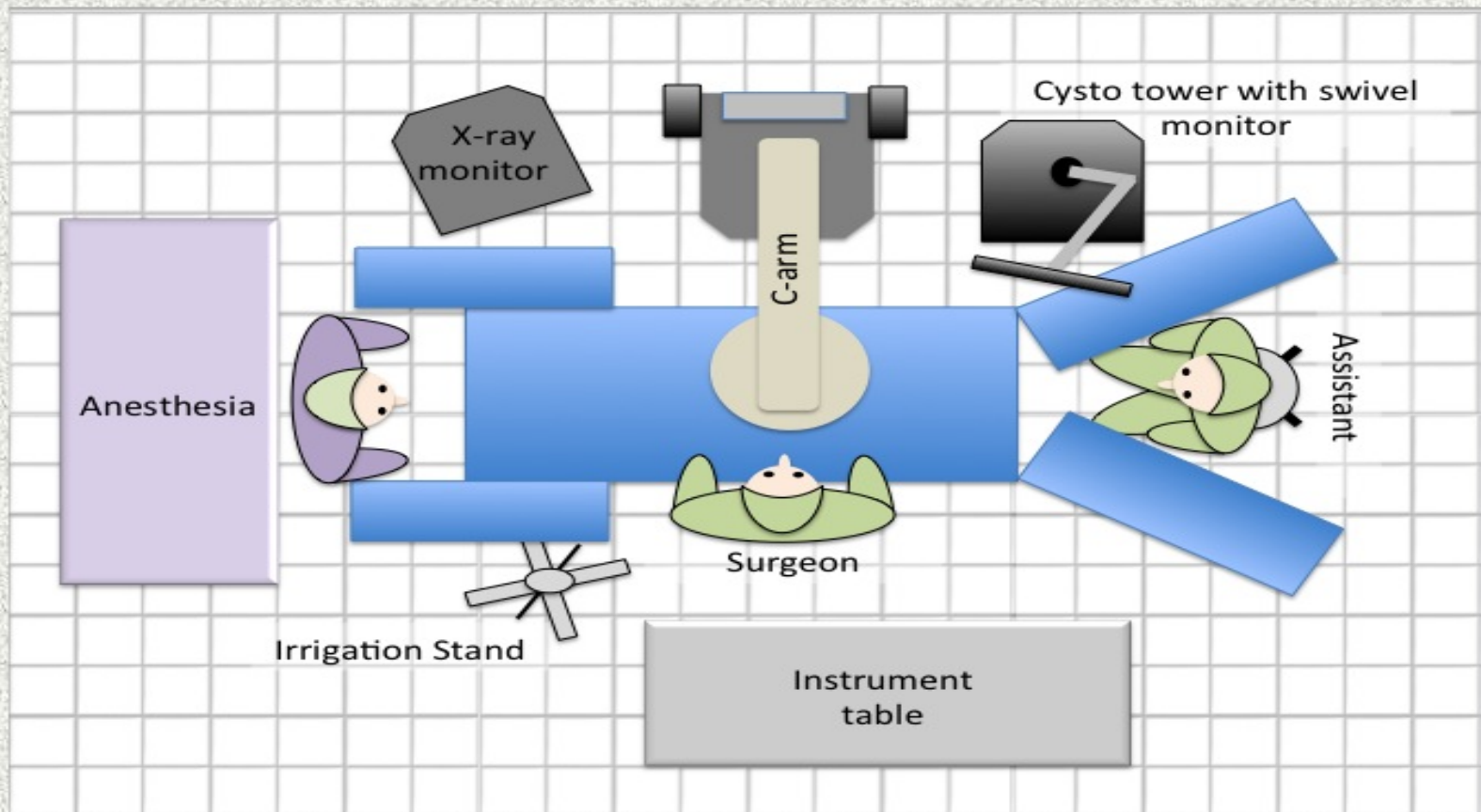
Cysto tower with swivel
monitor

Assistant

Surgeon

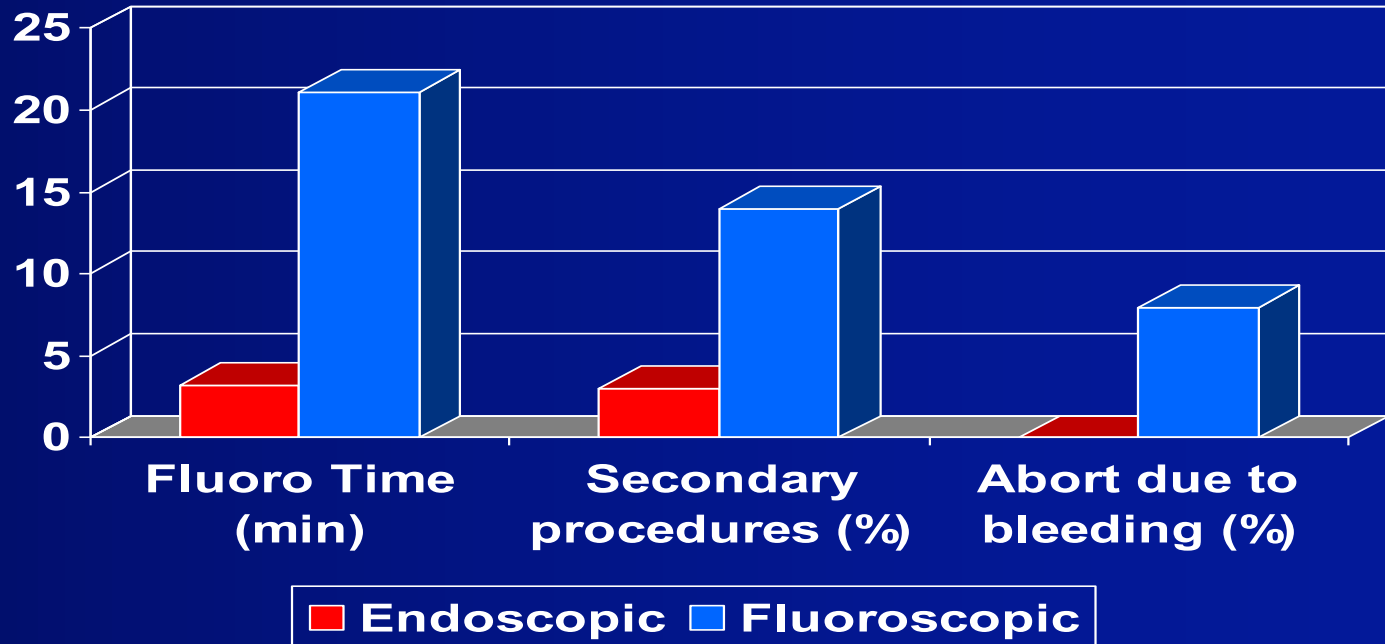
Irrigation Stand

Instrument
table



- 63 yo
- MH work-up
- Cysto negative
- PMH HTN and DM
- CR 0.89

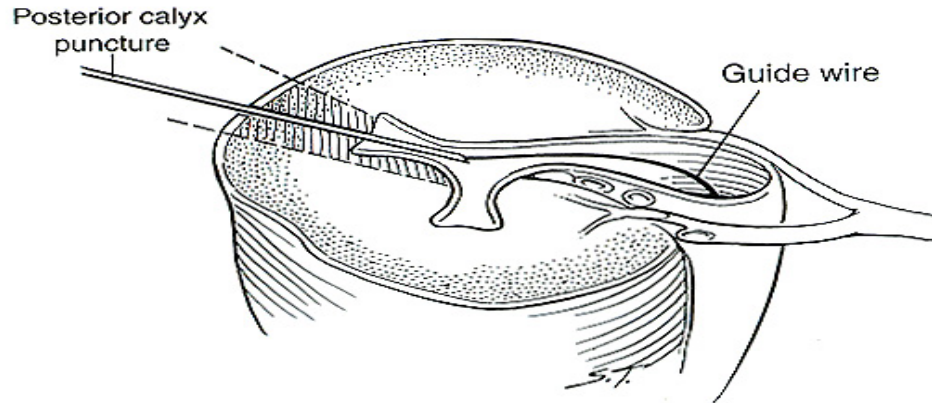
Endoscopic vs. Fluoroscopic PCNL



160 patients

Access

- Align with the pathology
 - Avoids the need for aggressive torquing



SUPINE PCNL

			No of Pts.
■	IRAN	Haghighi et al.	17
■	ROMANIA	Bucuras et al.	100
■	ITALY	Poggio et al.	212
	–	* 34% simultaneous URS	
	–	* 91% lower calyx	
■	SPAIN	J.M. Sanchez-zalabardo et al.	
	–	25 year experience – 818 patients	
		■ Colon Perforation 1	
		■ Failure caliceal puncture 15	

RADIOGRAPHIC COMPARISON OF PRONE VS. SUPINE PERCUTANEOUS NEPHROLITHOTOMY

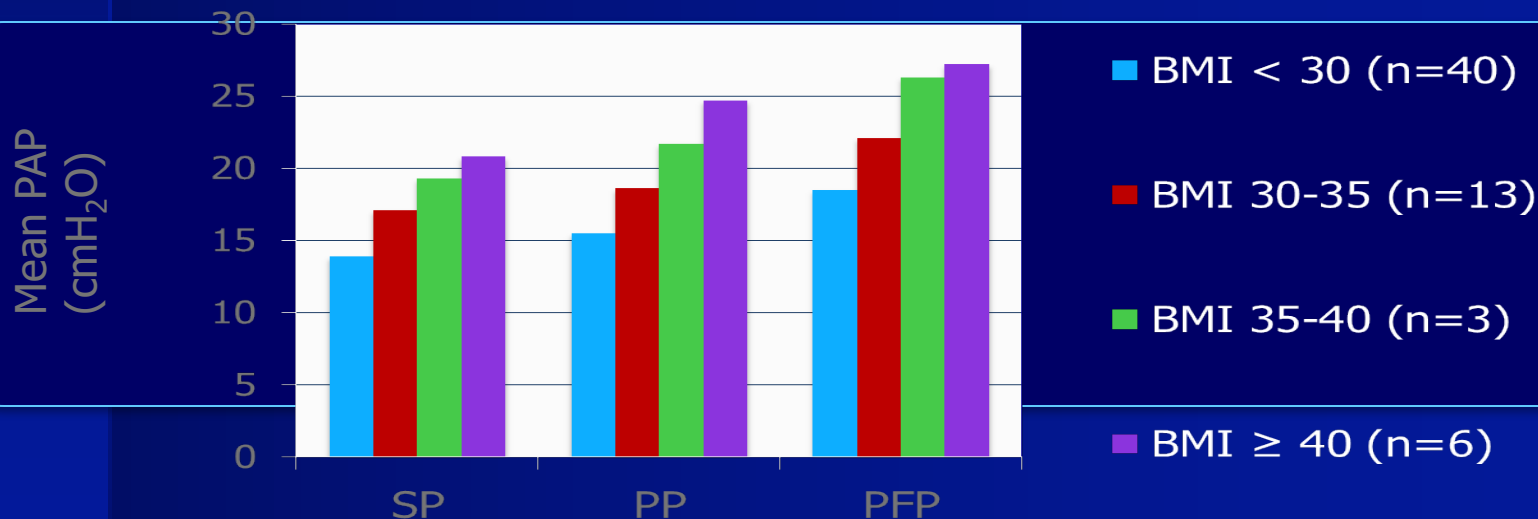
**N. Waingankar, Z. Okhunov, A.D. Smith, Z. Okeke
New York, USA**

- 20 patients – prone and supine CT
- Supine position leads to:
 - Longer tracts
 - 2 cm longer
 - narrower angles of instrumentation due to kidney lying more medially and relationship to bowel

**The Effect of Prone-Flexed Positioning (PFP) on Airway
Pressures During Percutaneous Nephrolithotomy (PCNL)**
K Foell, M Ordon, T Alzahrani, AG Lantz, KT Pace, RJD, A Honey
Division of Urology, St. Michael's Hospital, University of Toronto, Canada



- 63 patients
- All PAP < 40 cmH₂O
- No patients required repositioning for anesthetic or other reasons



DOES IT SAVE TIME?
IS THERE LESS RISK OF COMPRESSION, LESS NEED FOR PADDING?
IF THE PATIENT NEEDS REINTUBATION OR CPR.....?

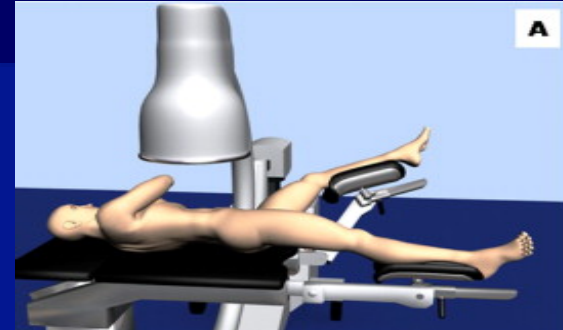


Fig. 2.1 Patient in the GMSV position, with the two jelly pillows under the thorax and the ankle

PRONE vs. SUPINE POSITION

- Data base from the CROES study: 5803 patients
- Prone position is more utilized: 4637 (80.3%)
- Surgical time was significantly less in favor of prone position: 82.7 vs. 90.1 minutes
- Stone free rate was significantly better in favor of prone position: 77.0 vs. 70.2
- Prone position presented a higher incidence of bleeding: 6.1 vs. 4.3 and fever: 11.1 vs. 7.6
- *Election of the position must be determined considering the characteristics of each patient and the surgeon preference*

Valdivia JG., CROES., J. Endourol., 25, 2011

Supine Versus Prone Position in Percutaneous Nephrolithotomy for Kidney Calculi: A Meta-Analysis

DongBo Yuan, MD,^{1,*} YongDa Liu, PhD, MD^{2,*} HaoFu Rao, MD,¹ TianFei Cheng, MD,¹
ZhaoLin Sun, MD,¹ YuanLin Wang, MD,¹ Jun Liu, MD,¹ WeiHong Chen, MD,¹
WeiDe Zhong, PhD, MD,³⁻⁶ and JianGuo Zhu, PhD, MD^{1,3}

■ Of RCTs included

- n = 336 prone, 333 supine
- No significant difference in SFR, transfusions, complication rate, or hospital LOS
- Shorter OR time in supine
- CAREFULLY SELECTED PTS (BMI < 30, stones deemed needing single access site)

UPPER POLE FOR EVERYONE

- 2012-2016
- 462 Patients
 - Supracostal
 - Upper calyx
 - Tubeless
 - Endoscopic guided
- Thoracentesis / Chest tube 3.2%
- Transfusion Rate 4.3%

PD30-5 PCNL

- Multivariable Cox Regression Predictors for Transfusion

Parameter	Pre-operative Multivariate Hazard Ratio (95% CI)
Preoperative hemoglobin	HR 0.81 (0.64-1.03) p=0.085
Bilateral PCNL	HR 4.43 (1.65-11.89) p=0.003
Diabetes mellitus	HR 3.15 (0.97=10.20) p=0.056



Indiana University Health



World J Urol. 1998;16(6):371-4.

The "mini-perc" technique: a less invasive alternative to percutaneous nephrolithotomy.

Jackman SV¹, Docimo SG, Cadeddu JA, Bishoff JT, Kavoussi LR, Jarrett TW.

⊕ **Author information**

Format: Abstract ▼

Tech Urol. 1999 Dec;5(4):223-5.

Mini-percutaneous antegrade endopyelotomy.

Monga M¹.

Format: Abstract ▼

J Endourol. 2000 Jun;14(5):419-21.

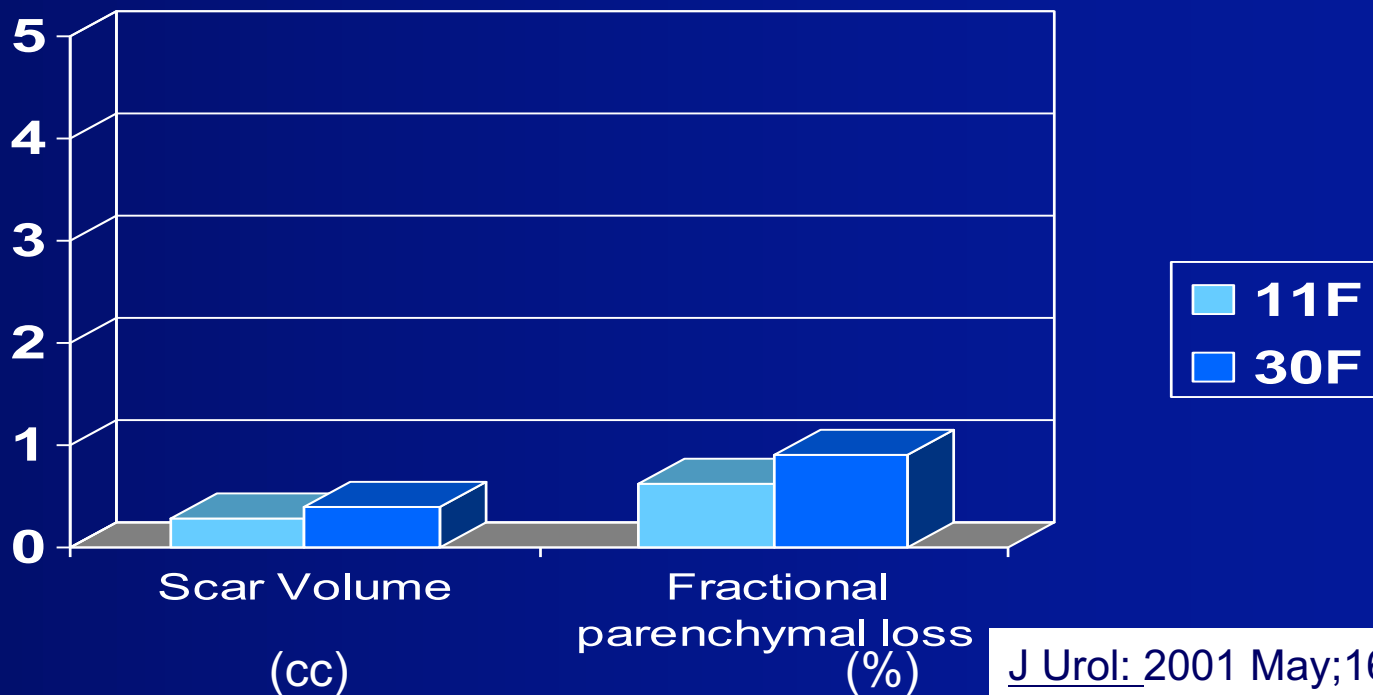
Minipercutaneous nephrolithotomy.

Monga M¹, Ogilevie S.

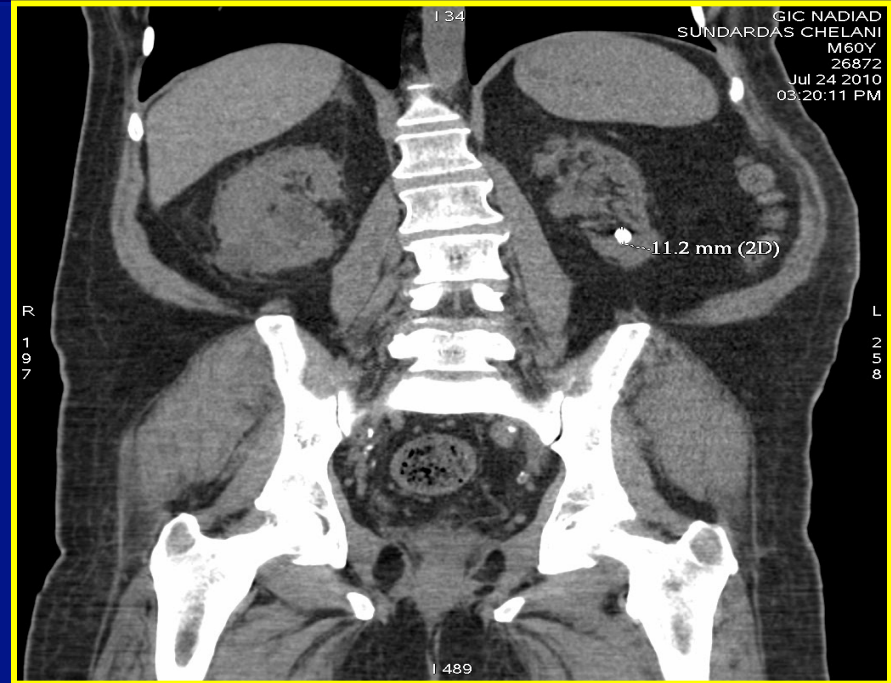
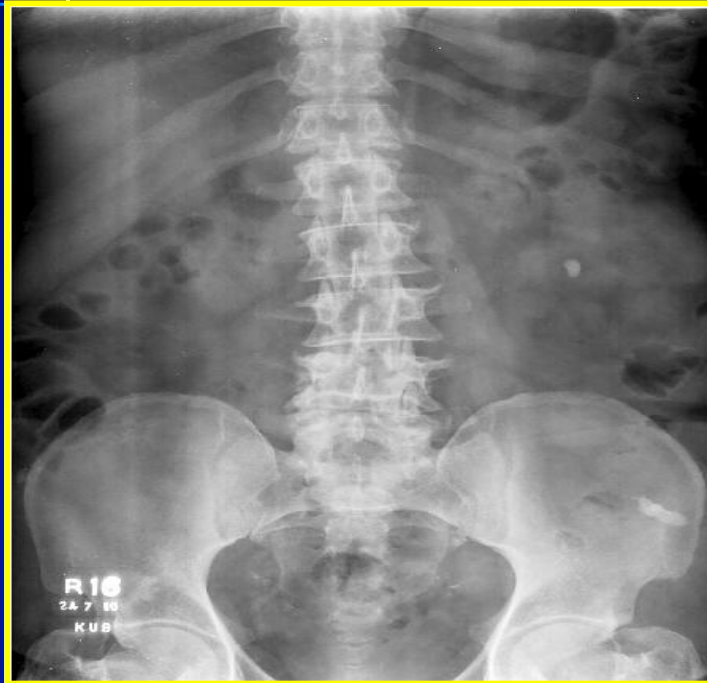
INVESTIGATIVE UROLOGY

RENAL PARENCHYMAL INJURY AFTER STANDARD AND MINI PERCUTANEOUS NEPHROSTOLITHOTOMY

OLIVIER TRAXER, THOMAS G. SMITH III, MARGARET S. PEARLE, T. SPARK CORWIN, HUSSEIN SABOORIAN, JEFFERY A. CADEDU



Small burden lower pole calculus - Hard



Courtesy: Professor Mahesh Desai

Nadiad Experience - LP

	Mini-PCNL (n=87)	Micro-PCNL (n=44)
Stone size	13mm	11mm
Hounsfield Units	1263	1303
OR time	57 min	59 min
Stone-Free	100%	90%
Hospital stay	2.8 days	3 days

Courtesy: Professor Mahesh Desai

Intrarenal pelvic pressure




[Urolithiasis](#)

June 2014, Volume 42, [Issue 3](#), pp 275–279

Comparison of intrarenal pelvic pressure during micro-percutaneous nephrolithotomy and conventional percutaneous nephrolithotomy

Authors

[Authors and affiliations](#)

Abdulkadir Tepeler , Tolga Akman, Mesrur Selcuk Silay, Muzaffer Akcay, Cevper Ersoz, Senad Kalkan, Abdullah Armagan, Kemal Sarica

	Conventional PNL	Microperc	<i>p</i>
Introduction	8.7 ± 2.4 (4.5–11.4)	12.2 ± 2.5 (9.02–16.5)	0.005
Fragmentation	15.3 ± 3.5 (9.02–21.05)	22.1 ± 3.3 (18.2–28.3)	<0.0001
Irrigation	20.1 ± 3.1 (15.03–26.8)	30.3 ± 3.9 (25.6–37.6)	<0.0001
End	8.9 ± 1.9 (5.26–11.2)	11.3 ± 1.8 (9.5–15.03)	0.011

Pressures in mmHg

Porcine Model of PCNL

E Coli Infusion

	“Mini” arm 10F sheath (ID) 7.5F scope	“Standard” arm 30F sheath (ID) 24F scope	p=
Mean intra-pelvic pressure (mmHg)	18.76 mmHg \pm 5.82	13.56 mmHg \pm 5.82	p<0.0001
Median time spent above 30mmHg (sec)	116.99 sec [98.02-165.53]	66.07 sec [33.44-109.08]	p=0.0452
Positive cultures:			
- Kidney	10/10	10/10	
- Spleen	10/10	6/10	p=0.0253
- Liver	9/10	3/10	p=0.0062
- Blood culture	3/10	0/10	p=0.0603



European Association of Urology



Stone Disease

Miniperc? No, Thank You!

Guido Giusti*, Alessandro Piccinelli, Gianluigi Taverna, Alessio Benetti, Luisa Pasini, Matteo Corinti, Alessandro Teppa, Silvia Zandegiacomo de Zorzi, Pierpaolo Graziotti

Department of Urology, Istituto Clinico Humanitas, IRCCS, via Manzoni 56, 20089 Rozzano, Milan, Italy

- SFR 77.5% in Mini group compared to 94% and 100% in standard and tubeless groups
- Mini-perc OR time ~50 min longer
- Less hgb drop and fewer transfusions in mini group
 - 3 transfusions in standard + tubeless group, 0 mini
- Hospital LOS comparable

Tubeless PCNL

- 1997 - Dr. Gary Bellman.
- Meta-analysis tubeless vs. conventional percutaneous nephrolithotomy
 - 621 patients in 10 randomized clinical trials.
 - all studies excluded patients with significant intraoperative bleeding, residual stone or major collecting system injury.
 - No significant difference in hemoglobin drop or post-op fever.
 - Length of hospitalization shorter (1.4 days)
 - less post-operative analgesic requirements

PERCUTANEOUS DRAINAGE

Tubeless Surgery

- Cochrane Review
- 11 randomized studies
- 13 retrospective and prospective studies
- < pain
- < analgesic requirements
- < hospital stay
- improved convalescence
- Morbidity and stone free rates similar

Urologia Internationalis, 88:373, 2012

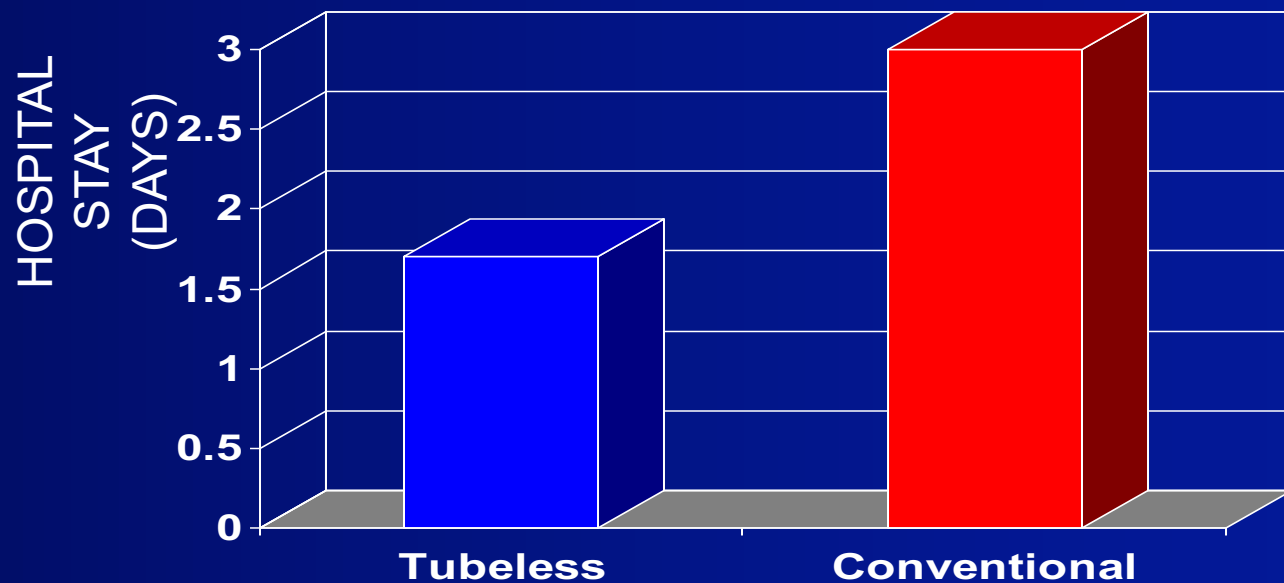
Courtesy Jorge Gutierrez-Aceves, AUA2015 Decade of PCNL

Tubeless percutaneous nephrolithotomy: outcomes with expanded indications.

Isac W¹, Rizkala E¹, Liu X¹, Noble M¹, Monga M¹.

Author information

1 Glickman Urological & Kidney Institute, The Cleveland Clinic, Cleveland, USA.

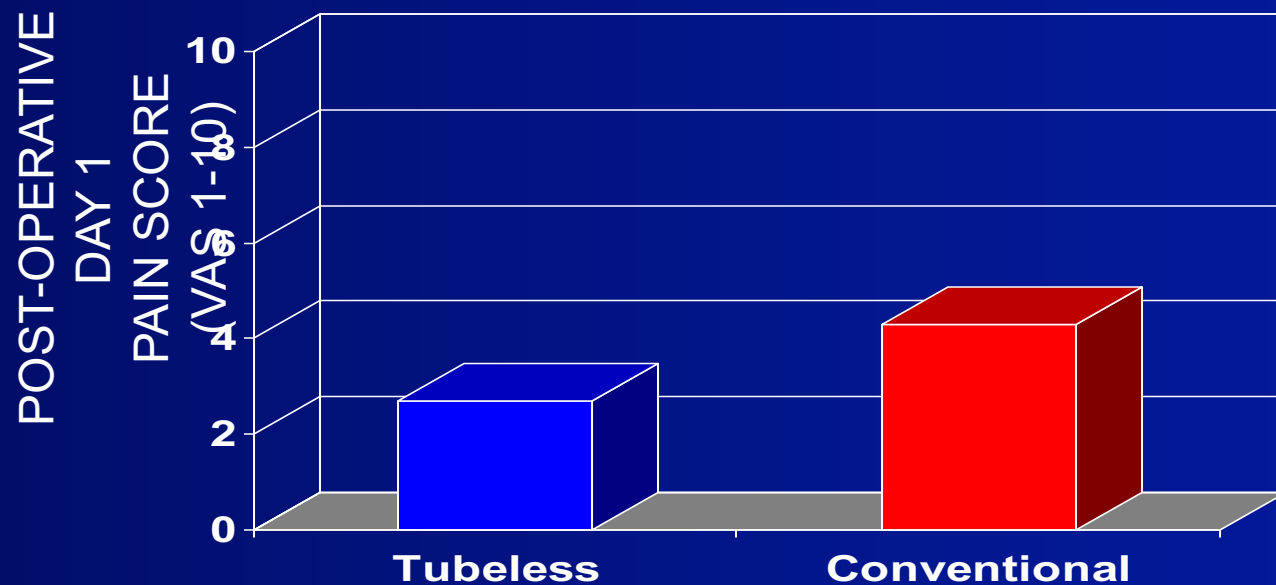


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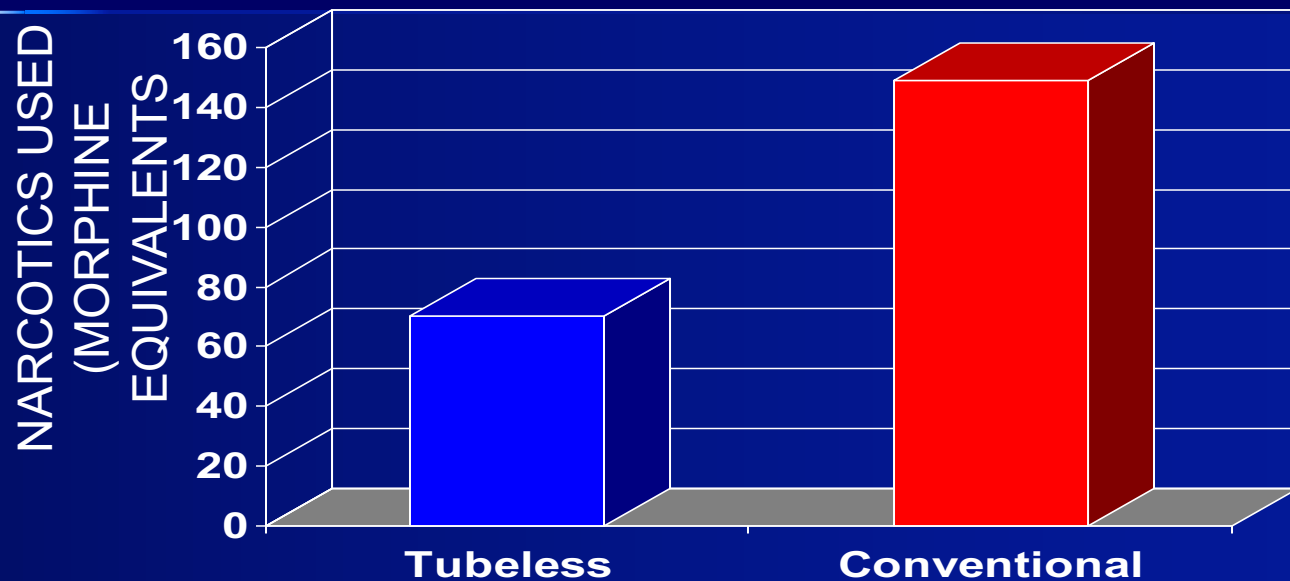


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Summary

- Endoscopic-guided access
- Prone Position
- Upper calyx puncture
- Single puncture with Flex Endo
- Maxi-Perc
- Tubeless