

# “Stone-free,” now what?

*A retrospective review of patients following stone free status*

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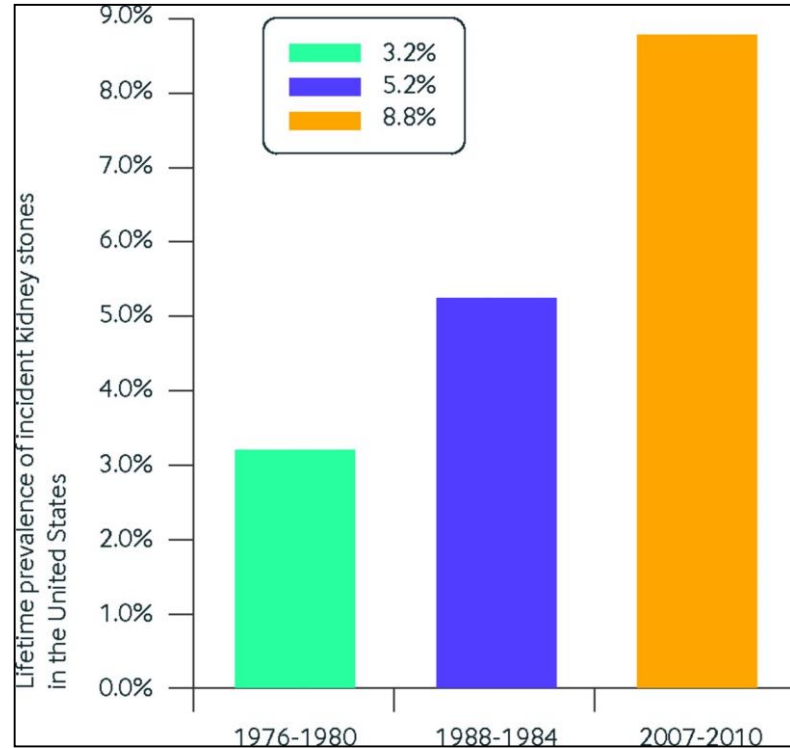
# Potential Conflict of Interest Disclosure

Speaker /Chair Name	Advisory Boards	Speaker's Bureau	Payment/Honoraria	Grants/Research Support	Clinical Trials	Investments	Patents
Betty Wang				None			
Mark Assmus				None			
Nicholas Dean				None			
Shubha De				None			
Trevor Schuler				None			
Timothy Wollin				None			

# Rising Incidence

Prevalence of stone disease in North America has increased, with a decreasing M:F ratio.

*How has the recurrence rate changed over the last 30 years?*



# Stone Recurrence

Historic data quoted 50% of all-comers presenting with a symptomatic stone episode will have a second episode within 5-8 years.

*What about patients with low stone burden?*

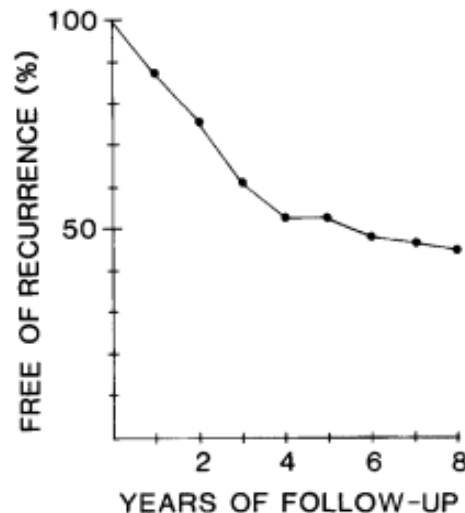


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## A Prospective Study of Renal Stone Recurrences

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**Fig.** Percentage of patients free of recurrence after their first renal stone in relation to time of follow-up.

# ROKS Nomograms

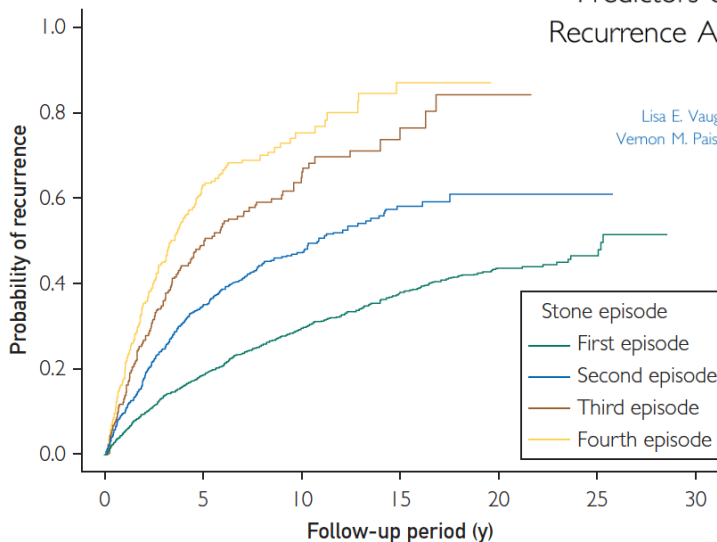
- 27 candidate predictors (patient, history and imaging factors) for subsequent events
- **>25% of stone events had no imaging data**



Predictor	All Stone Formers (n=2239, C Statistic=0.661)	
	Hazard Ratio (95% CI)	P Value
Age, per decade	0.89 (0.84 to 0.94)	<0.001
Male sex	1.29 (1.09 to 1.52)	0.003
White	1.32 (0.97 to 1.80)	0.07
Family history of stones	1.57 (1.34 to 1.86)	<0.001
Prior asymptomatic stone on past imaging	1.34 (0.99 to 1.81)	0.06
Prior suspected stone episode <sup>a</sup>	1.93 (1.51 to 2.46)	<0.001
Gross hematuria	1.08 (0.90 to 1.29)	0.42
Any nonobstructing stone	1.66 (1.41 to 1.94)	<0.001
Symptomatic pelvic or lower-pole stone	2.02 (1.67 to 2.45)	<0.001
Symptomatic ureterovesicular junction stone	0.87 (0.73 to 1.04)	0.12
Any known uric acid composition	2.37 (1.60 to 3.50)	<0.001



Predictors of Symptomatic Kidney Stone Recurrence After the First and Subsequent Episodes



Lisa E. Vaughan, MS; Felicity T. Enders, PhD; John C. Lieske, MD; Vernon M. Pais, MD; Marcelino E. Rivera, MD; Ramila A. Mehta, MS; Terri J. Vrtiska, MD; and Andrew D. Rule, MD

# Objectives



1. Evaluate the **stone event rate (SER)** for **low stone-burden** patients presenting with a single symptomatic urinary tract calculi who later achieved stone-free status
2. Detect differences in the SER by patient characteristics:
  - First time stone formers [FS]
  - vs.
  - Recurrent stone formers [RS]

# Methods



- Retrospective review: **119** adult stone patients
- Data Integration and Management Repository (DIMR)
  - Baseline demographics, stone burden on CT, and 8-year outcomes were added to an encrypted REDCap database
- **Symptomatic Stone Event** defined as:
  - a. Emergency department renal colic visit,
  - b. Urology stone consultation
  - c. Surgical intervention (URS, SWL, PCNL, or stent insertion for septic stone)
- 2-tailed t-test & Fisher's exact, with  $p < 0.05$  significant

# Data Collection



## Inclusion criteria:

- Adult stone patients (age >18), in Edmonton AB
- Seen by 1 of 4 urologists (TW, TS, MH, NJ), from April - Sept 2009
- Presenting with solitary stone seen on CT, later became **stone-free**
  - ***via surgical treatment, or spontaneous passage***

305 patient  
charts were  
reviewed



123 patients  
identified as solitary  
stone on CT



**119** patients  
achieved stone-  
free status



Followed for an  
**8** year period  
for stone events



# Patient Characteristics



Characteristic	Male	Female	Total
# of patients (%)	70 (59%)	49 (41%)	119 (100%)
Mean age at consult (range)	56 (27-80)	54 (18-94)	55 (18-94)
# of first time stone formers (%)	52 (74%)	28 (57%)	80 (67%)
# of recurrent stone formers (%)	18 (26%)	21 (43%)	39 (33%)

# SER within 8 years



Outcome	Entire Cohort
% with symptomatic stone event	<b><u>29%</u></b> (34/119)
% seen in emergency department	19% (23/119)
% seen in urology clinic	22% (26/119)
% requiring subsequent OR	20% (24/119)

# SER for First-Time Stone Formers (FS) vs. Recurrent (RS) within 8yr



Outcome	FS	RS	p-value
% with symptomatic stone event	<b><u>21%</u></b> (17/80)	<b><u>44%</u></b> (17/39)	p=0.02
% seen in emergency department	13% (10/80)	33% (13/39)	p=0.01
% seen in urology clinic	15% (12/80)	36% (14/39)	p=0.02
% requiring subsequent OR	14% (11/80)	33% (13/39)	p=0.01

# Conclusions



## **At our center,**

- 3 of 10 low stone burden patients will have at least 1 stone event within 8 years
- 1 in 5 will require subsequent operations
- First time stone formers have a lower SER at 21%, compared to recurrent formers (44%)

# Strengths

- **Everyone had reviewable CT at consult**
- **Patients initially achieved complete stone free status**
- **SER outcomes in our care model represent an accurate assessment of ED visits and peripheral center stone events**
- **Minimal migration/loss to follow up**



# Limitations

- Intra-observer variability in stone measurement/assessments of location
- No defined stone burden staging system
- No standard post-operative imaging modality/frequency
- Results are conservative estimates

# Future Direction

- To further quantify SER for patients with varying degrees of stone burden
- Build a prospective database to determine optimal timing and imaging modalities for follow up
- Develop a prototype clinically useful stone-burden classification system



**Questions?**