STONE ANALYSIS IS NOT MORE INFORMATIVE THAN 24 HOURS URINE COLLECTION

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CONCESSIONS

- Stone formation is what we actually care about
- Stone informs urinary environment at the time of formation and growth
- In many cases, 24hr urine tells us about the time around collection
- There are problems with stone analysis and with 24hr urine collection and interpretation

CONCESSIONS

Stone analysis may be the most important factor

Uric acid stones	7-10%
Cystine stones	1%

- What about 89% of stone formers?

Gutman, *Am J Med*, 1968, Mandel, *J Urol* 1989, Gault, *J Urol* 2000, Gentle, *J Urol* 1977

Lieske, *Clin J Am Soc Nephrol* 2014

Leusmann, *Scand J Urol Nephrol* 1990

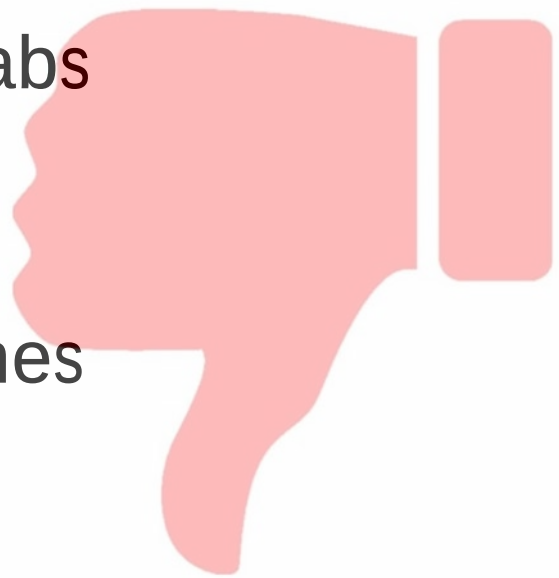
Pahira, *Urol Clin North Am* 1987

STONE ANALYSIS MAY BE WRONG

Stone analysis Error rate 6.5-94%

Compared to gold standard of Infrared Spectroscopy and micro-CT

- Sent samples to 5 commercial labs
- Great with pure stones 100%
    - only 7% of stones are pure
- Very inaccurate with mixed stones
    - Struvite
    - Mixed CaOx monohydrate
    - Mixed Ca apatite



Krambeck, *J Urol* 2010

Daudon, *Urol Res* 1995

Krambeck, *Urol Res 2010*

STONE ANALYSIS MAY BE WRONG

Also true in Europe

9 laboratories, 8 countries

- Only 56% of the labs fulfilled the quality requirements

- Wet chemical analysis
- IR spectroscopy
- X-ray Diffraction
- Maybe micro CT

Siener, *PLoS One* 2016

24 HR URINE CAN PREDICT STONE ANALYSIS

If you care about stone type:

- Supersaturations correspond to stone type
- Nomogram: BMI, age, and 24hr urine distinguish CaOx from uric acid stones
- Model 64% accurate at predicting stone type CaOx, Uric acid, CaPhos
- Pediatrics: 24hr urine associated CaOx (strong), Percent struvite (moderate), CaPhos (poor)

Parks, *Kid Int 1997*, Robertson, *NEJM* 1976
Torricelli, *J Endo* 2014
Moreira, *J Urol* 2013
Kirejczyk, *J Pediatr Urol* 2014

PROPHYLAXIS TO PREVENT RECURRENCE

- Diet:
  - Fluid intake, salt, animal protein, dietary calcium and oxalate
- Medical:
  - Excess calcium, uric acid
  - Low citrate

Fine, *J Urol* 1995
Coe, *Ann Int Med* 1977
Pearle, *J Endo* 1999
Kourambas, *J Endo* 2001

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RANDOMIZED DOUBLE-BLIND STUDY OF POTASSIUM CITRATE IN IDIOPATHIC HYPOCITRATURIC CALCIUM NEPHROLITHIASIS

P. BARCELO,* O. WUHL, E. SERVITGE, A. ROUSAUD AND C. Y. C. PAK

BJU International (1999), **84**, 393–398

A prospective study of nonmedical prophylaxis after a first kidney stone

R. KOČVARA, P. PLASGURA*, A. PETŘÍK†, G. LOUŽENSKÝ, K. BARTONÍČKOVÁ and I. DVOŘÁČEK

Idiopathic Hypocitraturic Calcium-Oxalate Nephrolithiasis Successfully Treated with Potassium Citrate

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Volume 215, Issue 4, January/December 1984, Pages 383-389

Thiazide Prophylaxis of Urolithiasis: A Double-Blind Study in General Practice (Article)

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