Trends and Disparities in United States Emergency Department Utilization of Computed Tomography for Suspected Urolithiasis
Dr. Balthazar receives research support from an RSNA R&E resident research grant.

Drs. Rosenkrantz, Hughes and Duszak receive research support from the Harvey L. Neiman Health Policy Institute.

Dr. Sadigh receives research support from RSNA R&E seed grant and AUR GERRAF award.
To study changing characteristics of utilization and potential disparities in the United States emergency department (ED) patients undergoing computed tomography of the abdomen and pelvis without contrast (CTAP) for suspected urolithiasis.
• Retrospective study of all ED patients from 2006-2015 with a primary diagnosis of suspected urolithiasis within the Nationwide Emergency Department Sample (NEDS), the largest publicly available all-payer ED database in the US.

• The annual number of ED visits for suspected urolithiasis and associated CTAP examinations per visit were determined.
• CTAP compound annual growth rate (CAGR) was calculated.

\[
\text{CAGR} = \left( \frac{\text{end value}}{\text{start value}} \right)^{\frac{1}{\text{years}}} - 1
\]

• Using multivariate logistic regression analyses, patient demographics and payer and hospital characteristics were evaluated as potential independent predictors of utilization.
Results

HOSPITAL CHARACTERISTICS
Characteristics of corresponding hospitals in NEDS database for 11,383,072 weighted patient-visits to US emergency department with suspected urolithiasis from 2006 to 2015.

GEOGRAPHIC LOCATION

- West: 17%
- Midwest: 23%
- South: 42%
- Northeast: 18%

TEACHING STATUS

- Teaching: 36%
- Non-teaching: 64%

URBAN STATUS

- Urban: 81%
- Rural: 19%
Results

- Nationwide, the number of ED visits/year for suspected urolithiasis increased from 1,057,119 in 2006 to 1,246,041 in 2014 (relative +17.9%).

- The annual use of CTAP increased from 24.6% to 49.4% per visit (relative +100.8%; CAGR +8.0%).
Results

Multivariate analysis showed higher CTAP use was associated with:

- **Higher household income** for patient ZIP code (OR wealthiest/poorest quartile= 1.48)
- **Private** payer status (OR= 1.21 vs. Medicare, and 1.22 vs. Medicaid)
- **Northeast** geographic region (OR= 5.07 vs. Midwest, 4.16 vs. West, 1.77 vs. South)
- Hospital **urban** status (OR urban/rural= 1.42)
- **Non-teaching** hospitals (OR= 1.20)

All p-values < 0.05
The relative use of CTAP in ED patients with suspected urolithiasis doubled between 2006 and 2014, and showed marked geographic variation.

In the setting of suspected urolithiasis, CTAP was used more frequently in ED patients from:

- Higher household income ZIP codes
- Private insurance
- Northeast
- Urban hospitals
- Non-teaching hospitals