

**AbstractID: 9312 Title: Structure and composition kidney-stone analyses using coherent-scatter computed tomography: Early results with a novel laboratory method**

**INTRODUCTION:** Many kidney stones have a heterogeneous composition in layers about a central core. At present, infrared spectroscopy (IRS) or conventional x-ray diffractometry are used to determine stone composition which is required to determine appropriate follow-up care for recurrence prevention. Both methods are limited requiring that stones be crushed prior to examination and a bulk measure of composition is obtained. We are currently conducting a clinical trial using coherent-scatter computed tomography (CSCT) as an ex-situ technique of stone analysis. We believe this technique will provide detailed structural information, including the initial nucleating mineral at the core of the stone.

**METHODS:** Our ongoing prospective trial examines urinary calculi from 100 consecutive eligible patients undergoing either percutaneous nephrolithotripsy or ureteroscopy. All calculi removed intra-operatively are analyzed with CSCT and then the same samples are sent for IRS (the standard of care at our center). Stone analyses from the two modalities are compared for overall bulk composition and the CSCT data analyzed to determine composition of the core.

**RESULTS:** Of the first 25 stones examined, 12 had core minerals that were not the primary component reported by IRS. In four, IRS reported 100% cystine where CSCT showed a distinct UA core inside cystine. In another, IRS reported 85% struvite while CSCT showed a calcium oxalate monohydrate core inside a struvite outer layer.

**CONCLUSIONS:** We are finding a significant fraction of stones in which IRS does not report the mineral component at the core of the stone as a large component of bulk composition. This raises the question whether recurrence rates could be improved by targeting the core component.