

## Internet Appendix A54: Emergency Medicine

### A54.1 Illustrative Pitch Template Example

This pitch is reverse engineered from the paper: R. Smith-Bindman et al. (2014), “Ultrasonography versus Computed Tomography for Suspected Nephrolithiasis”, *New England Journal of Medicine*, 371; 12, 1100-1110.

Pitcher's name	Marita Smith	For category	Emergency Medicine	Date completed	3/11/15
(A) Working Title	Ultrasonography versus Computed Tomography for suspected Nephrolithiasis				
(B) Basic Research Question	Should the initial screening method for patients with suspected nephrolithiasis (kidney stones) be ultrasonography or computed tomography?				
(C) Key paper(s)	<p>Westphalen, A.C., Hsia, R. Y., Maselli, J. H., Wang, R. and Gonzales, R. (2011). Radiological imaging of patients with suspected urinary tract stones: national trends, diagnoses, and predictors. <i>Academic Emergency Medicine</i> <b>18</b>, 699-707.</p> <p>Fwu, C.W., Eggers, P. W., Kimmel, P. L., Kusek, J. W. and Kirkali, Z. (2013). Emergency department visits, use of imaging, and drugs for urolithiasis have increased in the United States. <i>Kidney International</i> <b>83</b>, 479-486.</p> <p>Dalziel, P. J. and Noble, V. E. (2013). Bedside ultrasound and the assessment of renal colic: a review. <i>Emergency Medicine Journal</i> <b>30</b>, 3-8.</p>				
(D) Motivation/Puzzle	Pain associated with nephrolithiasis (the process of forming a urinary/kidney stone) is a common presenting factor in emergency departments. Computed tomography (CT) is widely used as the initial imaging test because of its high sensitivity. However, its widespread use as a screening tool has recently come under scrutiny as it exposes patients to ionizing radiation (and thus long-term cancer risk), is associated with a high rate of incidental findings requiring follow-up, and is more expensive than other methods. The literature fails to demonstrate that increased CT use has improved patient outcomes.				
THREE	Three core aspects of any empirical research project i.e. the “iDioTs” guide				
(E) Idea?	A multi-centre, randomized trial comparing ultrasonography with CT should indicate whether there is any benefit in continuing to use CT as the primary diagnosis tool for patients presenting to emergency departments across the USA with nephrolithiasis symptoms.				
(F) Data?	By examining patients that merit imaging by the emergency physician to rule out/establish a primary diagnosis of kidney stones (and are not pregnant, obese, or with prior kidney problems) and randomizing their screening, it should be possible to track several key outcomes over a six month follow-up period:				

	<ul style="list-style-type: none"> <li>- High-risk diagnoses with complications linked to missed/delayed diagnoses</li> <li>- cumulative radiation exposure</li> <li>- cost analysis</li> <li>- secondary outcomes e.g. serious adverse effects, patient-reported pain scores, return emergency department visits/hospitalizations</li> </ul>
(G) Tools?	Participating physicians and eligible, participating patients over a set time period; suitable ultrasonography and CT equipment; follow-up monitoring and patient interviews.
TWO	Two key questions
(H) What's New?	This study is the first large-scale examination of a diverse range of emergency departments to compare ultrasonography and CT for diagnosis of kidney stones. The proposed randomized design aims to assess clinically relevant outcomes that exceed simple diagnostic accuracy.
(I) So What?	This study will identify whether ultrasonography or CT is most beneficial as a screening tool for kidney stone diagnosis, aiming to minimize patient exposure to potentially harmful ionizing radiation and ensure accurate diagnosis and follow-up treatment.
ONE	One bottom line
(J) Contribution	This study aims to assess the relative benefits of ultrasonography versus CT in the environment of an emergency room diagnosis of suspected kidney stones.
(K) Other considerations	<p>Is Collaboration needed/desirable?</p> <ul style="list-style-type: none"> <li>-Idea: yes – physicians from multiple institutions should be involved in study design/execution</li> <li>-Data; yes – will need multiple participating physicians and data analysts</li> <li>-Tools; yes – participating institutions will use their own imaging equipment</li> </ul> <p>Target journals – <i>Kidney International</i>, <i>The New England Journal of Medicine</i>, <i>Journal of Urology</i></p> <p>“Risk” assessment:</p> <ul style="list-style-type: none"> <li>-“no result” risk: low. A study of this size is unlikely to return a null result.</li> <li>-“competitor risk”(i.e. being beaten by a competitor): low. The scope of this study makes it difficult to replicate easily.</li> <li>-risk of “obsolescence”: Low. Diagnosis efficiency is of key importance to emergency departments worldwide.</li> </ul>