EDITORIAL COMMENT

The authors present important information about the potential risk of secondary malignancy related to imaging for patients with nephrolithiasis. It is important to note that the authors found the absolute risk for any given patient to be low, but given the prevalence of nephrolithiasis, the overall risk for the population is significant. Whenever deciding on an imaging modality, the relative risks and benefits to the individual patient must be considered. For imaging ureteral stones, the American Urological Association does have a best practice paper which takes radiation exposure into consideration.[1] These recommendations suggest using plain abdominal radiography and ultrasound when clinically appropriate to reduce radiation exposure to patients. However, the reduced sensitivity of these modalities, particularly with ureteral stones, need to be balanced with the increased radiation from computed tomography (CT) scans.

One critical thing to note regarding the findings of the present paper is that the radiation exposure per stone episode used in this paper to model risk was from papers published prior to the wide spread use of low dose CT.[2,3] In the paper by Ferrandino et al, the dose of radiation from a single CT was reported to be 20 mSv per CT. In contrast, low dose CT, which is commonly performed, has a dose of 3 mSv or less[4] Therefore, the current study may significantly overestimate the actual risk.

Regardless, every effort should be made to reduce radiation exposure to our stone patients who are at high risk for recurrent exposure to ionizing radiation. In any clinical decision, the relative risks and benefits need to be weighed on a case by case basis. This paper helps inform patients of the potential risks of imaging during their stone episode.

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References

1. Fulgham PF, Assimos DG, Pearle MS, Preminger GM. Clinical effectiveness protocols for imaging in the management of ureteral calculous disease: AUA technology assessment. *J Urol.* 2013;189:1203–1213.
2. Ferrandino MN, Bagrodia A, Pierre SA, et al. Radiation exposure in the acute and short-term management of urolithiasis at 2 academic centers. *J Urol.* 2009;181:668–672. discussion 673.
3. Fahmy NM, Elkoushy MA, Andonian S. Effective radiation exposure in evaluation and follow-up of patients with urolithiasis. *Urology.* 2012;79:43–47.
4. Niemann T, Kollmann T, Bongartz G. Diagnostic performance of low-dose CT for the detection of urolithiasis: a meta-analysis. *Am J Roentgenol.* 2008;191:396–401.

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AUTHOR REPLY

We thank the authors of this editorial for their very thoughtful comments. They are correct that the use of low dose CT (LDCT) scan can significantly reduce the radiation dose associated with kidney stone management. The sensitivity of LDCT for nephrolithiasis is well-established and comparable to that of standard dose CT scan (SDCT), especially in nonobese patients.[1] Unfortunately, while the technology is available, limited evidence exists that widespread adoption of LDCT has occurred, especially in the emergency department setting where a significant percentage of imaging for nephrolithiasis is performed. In fact, an analysis of the American College of Radiology's dose registry identified that of CT scans performed for kidney stone evaluation, only 7.6% were considered "reduced-dose" scans in 2015-2016.[2] While this did represent an improvement from 2% in 2011-2012, the low rate of LDCT utilization suggests that our model, which was intentionally constructed to be a conservative estimate, is unlikely to overestimate the effects of the current impact of radiation use in kidney stone management. These data also demonstrate a clear target for change. Increasing substitution of standard dose CT with LDCT in the evaluation of renal colic and increasing the use of nonradiation based imaging such as ultrasound for follow-up of kidney stone patients, can drastically lower radiation doses in this high-risk population.

Ultimately the goal of any urologist treating kidney stone patients should be to provide optimal care while limiting radiation exposure. Unfortunately, the current data show we still have a long way to go in achieving this goal.

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References

1. Niemann T, Kollmann T, Bongartz G. Diagnostic performance of low-dose CT for the detection of urolithiasis: a meta-analysis. *Am J Roentgenol.* 2008;191:396–401. https://doi.org/10.2214/AJR.07.3414.
2. Weisenthal K, Karthik P, Shaw M, et al. Evaluation of kidney stones with reduced-radiation dose CT: progress from 2011-2012 to 2015-2016-not there yet. *Radiology.* 2018;286:581–589. https://doi.org/10.1148/radiol.2017170285. Epub 2017 Aug 31.

https://doi.org/10.1016/j.urology.2019.01.073
UROLOGY 130: 53, 2019.