

AUDIT TITLE

Clinical Audit of Low Radiation Dose CT KUB Studies for Suspected Urinary Tract Calculi

DESCRIPTOR

CT KUB is the gold standard for investigating renal colic¹. Due to the high prevalence of urinary tract calculi and its recurrent nature, cumulative effective radiation doses from repeated investigations can be high². Radiologists can accurately evaluate for urolithiasis using CT scans with an effective dose of 3 mSv or less³.

TARGET

Target should be set to achieve a feasible local standard based on current literature (e.g., at least 80% of studies having an effective dose of less than 3 mSv³).

METHODS

One hundred of the institution's most recent CT KUB studies should be collected. Dose-Length Product (DLP) should be collected to calculate the effective dose⁴. Patient information should include study indication, scan length and width at the iliac crests.

ACTION PLAN

In collaboration with a physicist, CT technologists, and radiologists, numerous measures consistent with current literature should be applied to achieve the target.

Changes may include:

- (i) decreasing the scan length to one cm above the kidneys to the pubic symphysis;
- (ii) adjusting the noise tube current modulation parameter to increase the noise level;
- (iii) setting a maximum and minimum tube current range; and
- (iv) use [or increase the level] of iterative reconstruction.

Image quality should be closely monitored to ensure that the resulting images are of sufficient diagnostic quality.

TARGET NOT ACHIEVED

Suggestions for improvement if the dose target is not achieved include:

- (i) consultation with CT physicist;
- (ii) education sessions and other behavior change strategies.

REFERENCES

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2. Katz SI, Saluja A, Brink JA, Forman HP. Radiation dose associated with unenhanced CT for suspected renal colic: impact of repetitive studies. AJR Am J Roentgenol. 2006 Apr; 186(4):1120-4.

3. Niemann T, Kollman T, Bongartz G. Diagnostic performance of low-dose CT for the detection of urolithiasis: a meta-analysis. *AJR Am J Roentgenol.* 2008 Aug; 191(2):396-401. Doi: 10.2214/AJR.07.3414.
4. AAPM Report, No. 96
5. Gervaise A, Naulet O, Beuret F, Henry C, Pernin M, Portron Y, Lapierre-Combes M. Low-dose CT with automatic tube current modulation, adaptive statistical iterative reconstruction, and low tube voltage for the diagnosis of renal colic: impact of body mass index. *AJR Am J Roentgenol.* 2014 Mar;202(3):553-60. doi: 10.2214/AJR.13.11350.

SUBMITTED BY

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SAMPLE DATA COLLECTION STRATEGY

Patient Identifier	Study Indication	DLP (mGy cm)	Effective Dose (mSv)	Scan Length	Patient Width