# Minimising radiation dose in computed tomography of kidneys, ureters and bladder (CT-KUB) [QSI Ref: XR-514]

**Descriptor:**

CT KUB scans should commence sufficiently cranially to include both kidneys in their entirety but be well collimated thereafter in order to minimise patient dose.

**Background:**

In patients with acute flank pain CT KUB is the favoured imaging technique to confirm the diagnosis of urinary tract calculi, in accordance with the Royal College of Radiologists and British Association of Urological Surgeons guidelines [1,2]. The equivalent dose can be reduced by minimising the size of the scan field with many authors quoting the upper border of T12 as an appropriate landmark to commence the examination [3]. However, many scans commence well above this level and thus impart an unnecessarily high radiation dose to the patient. Auditing the vertebral level at which both kidneys were fully imaged and comparing this with the vertebral level at which the scan was commenced is a means of assessing the degree to which CT-radiographers are restricting the size of the scan field.

## The Cycle

**The standard:**

The accepted practice is to image from the superior border of the kidneys (T10-T12) to the symphysis pubis.

**Target:**

100%

## Assess local practice

**Indicators:**

Vertebral level at which CT KUB scan commenced.

**Data items to be collected:**

1. Vertebral level at which kidneys fully included

2. Vertebral level at which scan commenced

3. Patient dose values as in CTDI (vol) and /or DAP

**Suggested number:**

100 consecutive CT KUB examinations.

**Suggestions for change if target not met:**

• Presentation at departmental audit meeting and discussion with radiologists and CT-radiographers

• Enable training for CT-radiographers to encourage limitation of the upper extent of scan coverage to T10

• Re-audit in 6 months

**Resources:**

Retrospective data collection from local Radiology Information System/PACS

Radiologist or CT radiographer time 4-6 hours

**References:**

1. iRefer. Making best use of a Department of Clinical Radiology, Guidelines for Doctors, 8th Edition 2017, The Royal College of Radiologists, London.
2. Alexios Tsiotras, R Daron Smith, Ian Pearce,  Kieran O’Flynn and Oliver Wiseman. British Association of Urological  Surgeons standards for management of acute ureteric colic.  Journal of Clinical Urology 2018, Vol. 11(1) 58 –61.Sagepub.co.uk/journals  DOI: 10.1177/2051415817740492 journals.sagepub.com/home/uro
3. Fundamentals of Body CT. Third edition. Webb WR, Brant WE, Major NM. Elsevier - Health Sciences Division. November 2005. Page 276.

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