**Image rejection analysis in digital radiography**

**Descriptor**

Image rejection analysis in digital radiology imaging departments.

**Background**

Image rejection analysis is an important post-exposure element of quality control and identifies examinations and rooms for improvement. Repeat exposures increases radiation dose to the patient, equipment operating cost and increases total scan time. Moreover, imaging department practitioners and operators are required under IR(ME)R 2017 optimisation regulation 12(1) [1] to ensure that doses are kept as low as practicable (ALARP). Rejection analysis can therefore potentially identify areas of improvement for reducing patient dose, along with improving departmental work flow through impacting processing and recall rates.

**The Cycle**

**The standard**

No specific quantitative standard exists, but rejection rates are documented between 2.3-12% [2-7]. Departments should also be encouraged to focus on quality improvement strategies to identify the causes of image rejects, particularly in anatomical-specific examinations more likely to result in rejection. Practice can then be improved by developing specific guidance on criteria for image rejection, along with methods of coding the rationale for rejection for audit purposes. Since this is largely to do with operators’ practice, involvement of the Radiographers and Assistant Practitioners is recommended at the outset. Since radiographer and radiologist assessment of image quality may differ [8], it may be useful for radiological review of a random selection of rejected images to ascertain if they would have been of diagnostic quality and need not have been rejected.

Common reasons for image rejection in the era of digital radiography:

* Positioning error i.e., rotation error (commonest)
* Centering error - the ROI is not in the centre of the image
* Incorrect collimation
* Incorrect exposure
* Artefact
* Other reason

**Target**

Rejection rates should remain below a suggested rate of 2 - 5%.

**Assess local practice**

**Indicators**

The frequencies of image rejection occurring with digital radiography in general X-ray imaging departments.

**Data items to be collected**

The room in which the examination was performed to identity hardware issues. Number of examinations performed, anatomical region, inpatient/outpatient and paediatric/adult. Number of rejected examinations (and reason categories):

• Positioning error i.e., rotation error

• Centering error - the ROI is not in the centre of the image

• Incorrect collimation

• Incorrect exposure

• Artefact (and type e.g., motion).

• Other reason NB. Images can be deleted on the workstation of the modality or in PACS (Picture Archiving and Communications System) stations. Care should be taken to record all exposed and deleted images.

**Suggested number**

All exposed general radiography examinations performed during a one-month period.

**Suggestions for change if target not met**

* Develop quality improvement strategies using PDSA cycle to improve rejection rates e.g. patient positioning training.
* Radiographer understanding of imaging rejection and causes (e.g., questionnaire) to guide areas of further training.
* Review of rejected images (e.g., by senior radiographer or radiologist) to assess diagnostic quality and develop criteria for rejection.
* Re-audit following implementation of change to assess for improvement.

**Resources**

Collect data using reject analysis software within X-ray console workstation.

**References**

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