

# A Student Self Audit on Repeat Rates for Knee X-rays in Clinical Practice

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## Introduction

All Radiographers aim to produce diagnostically acceptable images first time and are responsible for deciding whether to accept or repeat each image according to a specific set of criteria. However higher repeat rates result in higher radiation exposure to patients (Owusu-Banahene, Darko, Hasford, Addison & Okyere, 2014) which is going against the ALARP principle (IR(ME)R, 2000). This ultimately results in increased waiting times, increased costs and consequently decreased patient satisfaction (Mount, 2016). Research suggests that with digital radiography (DR) becoming more popular in departments it is becoming easier and quicker to repeat radiographs (Waalder, & Hofmann, 2010). It is important to determine the cause for the increase in the reject and repeat of radiographs which is done by conducting clinical audits (Owusu-Banahene et al, 2014). This ensures clinical standards are being met and maintained and determines areas of practice to be improved, with the overall focus on improving patient care (Lau & Ng, 2014).

## Objectives

The aim of this audit was to compare the individuals repeat rate for knee x-rays against a standard to highlight areas of strengths and areas for improvement within clinical practice.

## Standards

In a study conducted by Clark & Hogg (2003) the repeat rate for a knee x-ray conducted in an orthopaedic department was 8.6% (n= 49) and this was the used standard in the study. Currently, there are no published national reject rates.

## Methodology

Firstly an audit tool was designed and a pilot study was conducted over three days to test the reliability and validity of the suggested data collection method. Initially all lower limb examinations were to be recorded however it soon became apparent that the majority of repeated examinations were knee x-rays and from this it was decided that knees would be the main focus of this audit. Moreover, children were excluded from the study due to the small number of children's examinations recorded in the pilot study (n=2). Prospective data was collected over a two week period in the orthopaedics department of a local NHS hospital. Anteroposterior (AP), Lateral (LAT) and Skyline (SKY) knee projections completed on adults were recorded. Positioning was in accordance with Clark's positioning in Radiography (Whitley, Sloane, Jefferson, Holmes, & Anderson, 2016). For every examination that required a repeat, a reason was required. The possible options were 'collimation', 'centring', 'exposure', 'rotation' or 'other' in which a comment was provided.

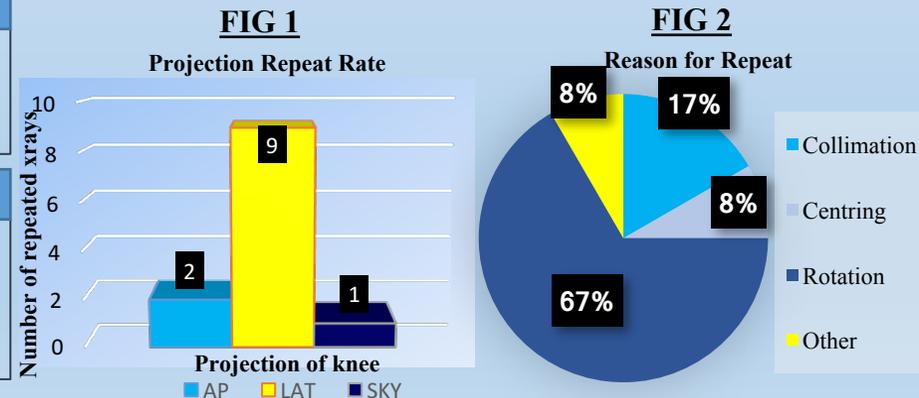
## Results Continued

Figure 1 shows that the most repeated projection was the lateral knee x-ray. Figure 2 suggests that the most common reason for repeating an x-ray was due to rotation (67%, n=8). Overall, the results indicate that lateral knee x-rays are the most repeated projection with all repeats requiring more internal rotation of the knee. The calculated repeat rate for this audit was 17.9% which is more than double the 8.6% repeat rate stated in the standard used.

## Discussion

Results from this audit differ to those of a similar study conducted by Clark & Hogg (2003) where the most common reason for repeating a knee x-ray was due to missing anatomy (62%, n=30). The smaller sample used in this student self audit could account for this difference. Although similarly both studies were conducted in a busy orthopaedic department where patients often have a reduced range of movement, resulting in more x-rays needing to be repeated to achieve desired positions. These results cannot be fully compared with the standard repeat rate as the standard relates to fully qualified Radiographers. Research suggests students have much higher repeat rates than qualified Radiographers (Clark & Hogg, 2003) as demonstrated here.

## Results



## Action Plan

A larger degree of internal rotation should be applied initially when positioning for lateral knee x-rays to minimise repeat x-rays. Revision notes should be reviewed and more experience in clinical placement will improve technique. A re-audit should be completed once qualified, following 3 months work in first post, using a larger sample and conducted over a longer period of time.

## References

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# Abstract

The need to repeat x-rays consequently results in higher radiation exposure to patients. Clinical audits help establish the cause for repeat and highlights areas for improvement. The aim of this audit was to compare the individuals repeat rate for knee x-rays against a standard to determine current level of practice. The standard repeat rate was 8.6%, taken from research by Clark and Hogg (2003). Data was collected over a two week period in the orthopaedics department of a local NHS hospital. In total 67 adult radiographs were collected, including a combination of Anteroposterior (AP), Lateral (LAT) and Skyline (SKY) knee projections. Comments were provided to explain the reason for repeat. Out of the 67 radiographs, 12 were repeated, resulting in a calculated repeat rate of 17.9%. The lateral knee x-ray was the most repeated projection. Rotation was the most common reason for repeating an x-ray (67%). The calculated repeat rate was more than double the repeat rate of 8.6% from the standard. Applying a larger degree of rotation initially for lateral knee projections will reduce the repeat rate, reducing dose to the patient. Continuous clinical audit ensures standards are maintained, highlights areas to be developed and improves patient care.

*Key words: Repeat rate, audit, lateral knee, digital radiography, rotation, X-rays*

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