RSNA 2024
Building Intelligent Connections

Chest x-ray Image Quality Improvement

Buckinghamshire Healthcare NHS Trust

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Disclosures

- None

Introduction

- There was perception that planar chest imaging in our department was not of the standard expected quality.
- Acquiring two images when the entire volume was not present was a regular phenomenon.
- AP lordotic imaging was a regular observation on emergency images.
- Presence of garment artefacts was not uncommon.
- The purpose of this quality improvement project was to bring back the culture of standard planar chest images in all settings.

Methods : Plan, Do, Study and Act Format

- Plan : All out patient chest x-rays to be of standard quality
- Standard quality is specified as :

- Every effort should be made to perform a PA erect chest x-ray
- The standard will vary between different referral groups – i.e in-patient (IP), general practice (GP), out patient (OP) or Emergency department (ED) referral.
- The standard includes
    - technical adequacy of exposure/penetration, inspiratory effort, rotation, angulation

Target :

75% PA erect for IP and ED patients

95% PA erect for OP and GP patients

Do :

Following local ethics committee approval, team engagement from planar imaging leads, radiology manager, education lead, an initial retrospective audit of 100 chest x-rays performed in the ED over 3 days in March 2023. Portable radiographs were excluded.

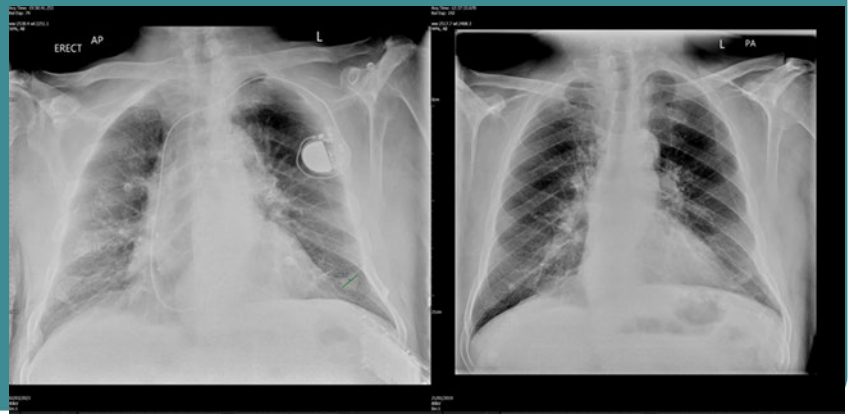
Study :

- The following observations were made :

- AP (antero-posterior) or PA (postero-anterior)
- Presence of artefacts (removable e.g clothing)
- Number of images acquired for the episode
- Lordosis (if any)
- Rotation (if any)
- Sub lordotic angulation (if any)
- Suboptimal inspiration
- Supine view
- Image cut off
- Good PA
- Good AP

AP erect

PA erect



Act :

Interventions June to October 2023 / March 2024

1. Feedback to Radiographer leads and Radiology manager
2. One on one confidential feedback to individual radiographers by Radiographer leads
3. Educational sessions by Education Lead and Radiographer Leads

The audit cycle was repeated in November 2023 and March 2024.

Analysis :

Qualitative and quantitative observational criteria for inference of the image quality is utilised.

Results : summary of total of 100 chest x-rays evaluated per cycle

	March 2023	November 2023	March 2024
AP	57	42	30
PA	43	58	70
Artefacts	17	8	0
Lordotic view	33	12	1
Two images	15	12	4
Supine	5	1	2
Rotated image	39	26	3
Sublordotic angulation	4	2	2
Suboptimal inspiration	39	33	16
Image cut off	4	1	0
Good PA	4	24	55
Good AP	0	4	17

Observations

- Significant improvement in all categories.
- Zero image artefacts
- Zero image cut off

- Good standard PA improved from 9% (n=4) to 78% (n=55).

- Lordotic view decreased from 33% to 1%.
- Rotated image decreased from 39% to 3%.

Discussion :

- Limitations

- The mode of transport/ mobility of the patients have not been ascertained. The target may be altered such as 100% walking patients, 80% chair patients and 10% of trolley patients in the ED setting.

- Recommendations

1. Continue one on one feedback.
2. Continue practical and educational sessions and mentorship.
3. If issues with the equipment, radiographer leads / manager to attend.
4. Radiographers are encouraged to record specific issues and suggestions
5. Radiologists educational sessions emphasizing the diagnostic importance of good quality chest x-rays.

Conclusions :

- The culture of standard chest x-rays and quality has become an expression of pride in our radiographer teams in seeing the product.
- Bringing out the best of oneself has been a great reward for the entire team.

Reference :
Quality of chest x-rays [QSI Ref: XR-503] | The Royal College of Radiologists (rcr.ac.uk)

Thank You to All our BHT Radiographers and Radiographer Leads.

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Thank You to BHT Radiology Site Co-Ordinator Richard Watson-Darby.
Thank You to BHT Cross-Site Lead Radiographer Clive Christian.

Thank You

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