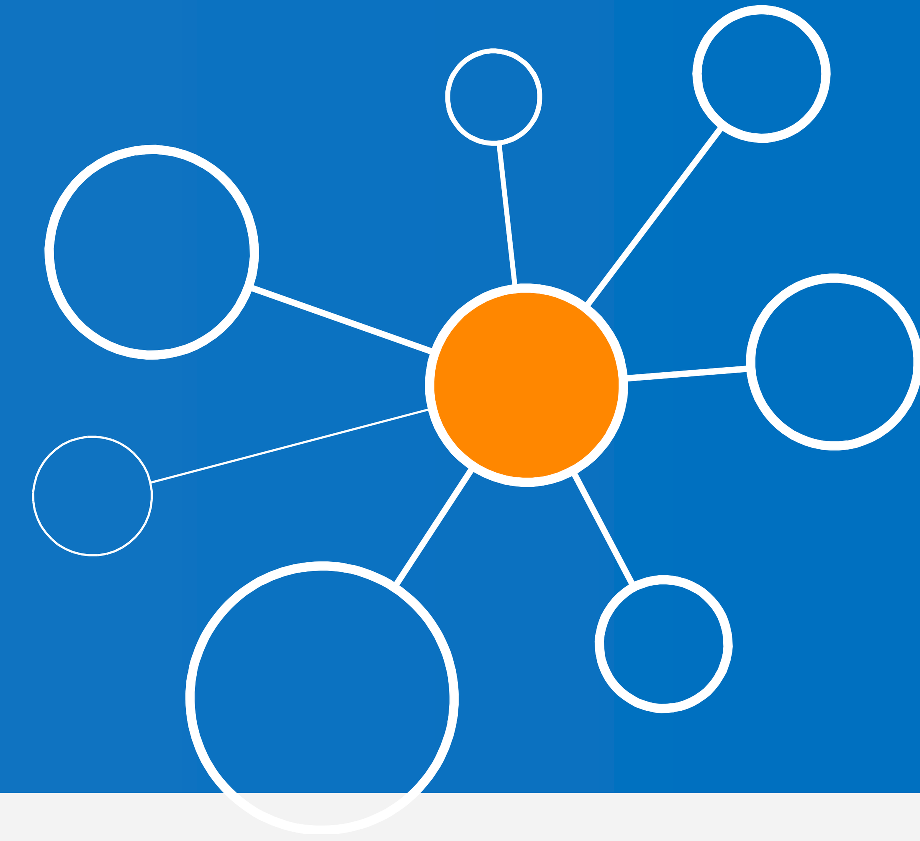
Gloucestershire Safety & Quality Improvement Academy

Gloucestershire Hospitals NHS
NHS Foundation Trust



Reducing Unnecessary Chest X-Ray Requesting in patients presenting with Chest Pain

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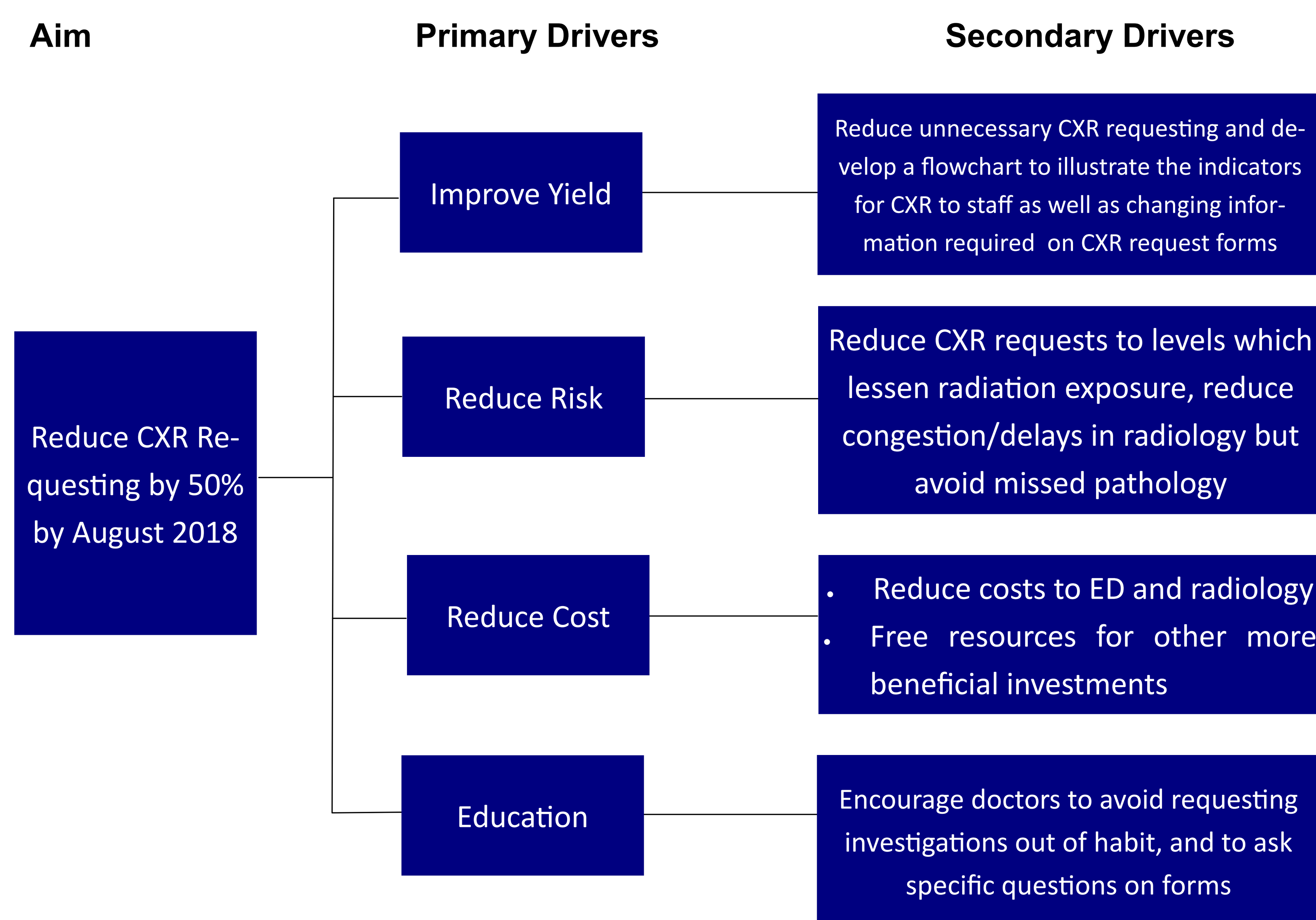
1. Rationale

Chest X-ray (CXR) requesting is commonplace for patients in the ED and Acute medical Units. Where the CXR is not answering a specific question (a 'focused' investigation), it has a low positive yield, high cost (approximately £75) and exposes many to unnecessary radiation. In addition, it contributes to a heavy workload in radiology as well as consuming valuable resources.

2. Aims

The primary aims of this project were to improve awareness amongst medical staff of the importance and benefits of using investigations in a focused manner which will improve the yield (number of true positive results) whilst reducing the numbers of 'false positives' (spurious positive results which may cause difficulty in clinical decision making) as well as negative results, without increasing the risk of missed pathology.

Driver Diagram

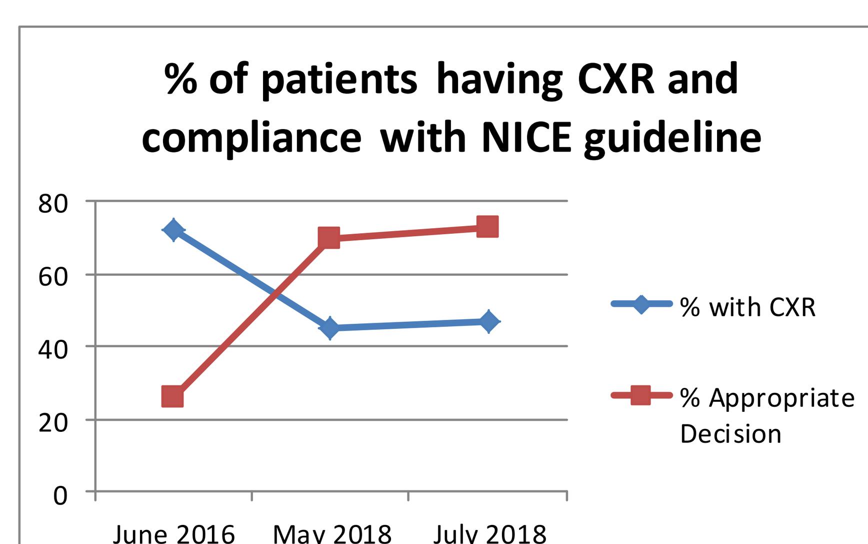


Results

- Initial Audit– 281 consecutive patients, 2016
- **73%** had a CXR requested and performed
- **26%** of these decisions were consistent with NICE guideline
- **1.4%** had significant pathology, **all of which was identifiable in history and examination**

- Re-audit 1 May 2018 (post ED implementation)- 20 random patients, both sites
- **45%** had a CXR, **70%** of decisions consistent with NICE guideline

- Re-audit 2 July 2018 (post Medical Grand Rounds)- 30 random patients, both sites
- **47%** had a CXR, **73%** of decisions complied with NICE guideline



No missed pathology identified on Datix or CXR reviews

3. Supporting Evidence

There have been several studies in the past, the results of which support the rationale and aims of this project[1,2,3]. In particular, the NICE guidance (CG95) 2010, updated 2016[1]) does not recommend non-invasive radiography in the absence of physical signs (dyspnoea, pneumothorax, effusion).

PDSA Cycles

Planning– Initial study to demonstrate the existing problem (281 consecutive patients- this showed that although 72% had X-rays, only 4 showed pathology, and all 4 had relevant clinical signs present. Of the X-rays done, only 28% were reported in the notes.

Doing– Develop guide in accordance with NICE CG95– CXR when pt with chest pain has dyspnoea, low SpO2 or clear physical signs to indicate likely pathology, then this was presented to ED staff, along with rationale– risk reduction (radiation exposure, radiology workload and risk of missing pathology secondary to this) and benefits (cost savings, reduced ED consultant workload following spurious results. Discussion with radiology clinical director, and now CXR requests with 'chest pain' are not accepted (no specific question asked)

Studying– regular re-auditing of random samples of 20-30 patients at a time and comparing results to original study. Results presented at ED handover meetings with positive feedback to reinforce the improvements

Actions– When ED cycle had gained momentum, study and results discussed with acute physicians, and then presented at the Medical Grand Rounds in order to persuade them to engage with the process.

Future Actions– The project and repeat audits will be carried on to the next group of new ED and AMU doctors in August– this will, hopefully, ultimately change the culture of 'routine' X-ray requesting which will be to the benefit of both our patients and the Trust.

Conclusions and Future plans…

- **The results so far indicate a reduction in CXR requesting of between 35% and 37% in patients presenting with cardiac sounding chest pain following relatively simple interventions to modify requesting practice in ED and AMU/ACUC**
- **Significant improvement in compliance with NICE guidelines**
- **The modification has not resulted in any missed pathology**
- **Repeat audit appears to show consistency which is encouraging**
- **Limitations- secondary audits were smaller and potentially subject to a type 1 error. Repeat audits should reduce this risk**

The Future

- **Repeat presentations for new incumbents, and repeat audits throughout the next year**
- **Continue with positive feedback to reinforce the change in custom and habit (chocolate works well, too)**
- **If the current change is sustained, there is a potential Trust saving of up to £145,000 per annum with no adverse impact on patients.**

References

1. NICE Guideline CG95 (Assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin (November 2016 update))
2. Ng JJL, Taylor D Routine chest radiography in uncomplicated suspected acute coronary syndrome rarely yields significant pathology. Emerg Med J 2008;25:807-810
3. Newsom C *et al* Chest X-Ray Yield in Patients With Isolated Chest Pain: Derivation of a Decision Rule. Ann. Emerg. Med. 2013;62(Supp 4S):87