CXR CARDIAC PATIENTS AUDIT

MARCH-APRIL-MAY 2024

ANTONOGIANNAKIS TASSOS, ANAESTHETICS SCF

CHATZISTAMATI ANASTASIA, ITU JCF

RESPONSIBLE CONSULTANT: DR SIMON MATTISON, ANAESTHETICS

BACKGROUND

- Current practice is to CXR every patient immediately after cardiac surgery.
- No standardized protocol? 3-5 CXR's per uncomplicated patient.
- Cost? Radiation? Unnecessary delays if clinician defers extubation until result available.
- Dubious benefit.

AUDIT RESULTS

- 77 random patients over 3 month period
- No MCS, transplant, redo's
- Data from recovery patients.
- Immediate responsible physician (Recovery Consultant/SpR/SHO) → "Did reviewing this CXR change management of this patient in any way?"

CXR result



FURTHER ANALYSIS

- 8/77 some change in management.
- 5/8 → diuretics or fluid restriction. Common practice anyway & other ways to infer fluid balance (CVP, oxygenation parameters, I/O chart?)
- 2/8 → Hemothorax. I was reexplored, I was managed conservatively. Other clinical signs that would prompt clinical review were present (hemodynamic instability, reduced breath sounds, drain output)
- I/8 → Lobar collapse. Ordered bronchoscopy for airway toilet. Patient was hypoxemic.

FORMAL REPORTS

- Reported on the next working day at the earliest.
- Screening benefit?
- What is the cost and burden of reporting them by consultant radiologists?
- Atelectasis, pleural effusion, pulmonary congestion invariably reported → Maybe another area of improvement? [recruitment manuevers, fluid management]

EVIDENCE?

- Review of literature revealed 4 relevant studies.
- All in support of restricting CXR's being a safe practice.

Study	Туре	Date	Conclusion
Rao PS, Abid Q, Khan KJ et al. Evaluation of routine postoperative chest X-rays in the management of the cardiac surgical patient. Eur J Cardiothorac Surg. 1997 Nov;12(5):724-9. doi: 10.1016/s1010- 7940(97)00132-2.	3 groups, 100 patients each. $A \rightarrow 3$ routine CXR's $B \rightarrow 1$ routine CXR $C \rightarrow 0$ routine CXR		There was no mortality or morbidity attributable to non-performance of routine chest X-ray. Routine chest X-rays post-cardiac surgery are of very little value and patients are adequately managed by performing chest X-rays only when clinically indicated. There was no increased mortality or morbidity attributed to lack of routine chest X-rays in any of these groups. We recommend performing chest X-rays only when clinically indicated in satisfactorily recovering adult cardiac surgical patients.
Tolsma, M., Bentala, M., Rosseel, P.M.J. <i>et al.</i> The value of routine chest radiographs after minimally invasive cardiac surgery: an observational cohort study. <i>J Cardiothorac</i> Surg 9 , 174 (2014)	249+249 patients CXR in MICS vs median sternotomy	2014	The diagnostic efficacy of routine CXRs performed after minimally invasive cardiac surgery by port access or bilateral VATS is higher than the efficacy of CXRs performed after conventional cardiac surgery. A routine CXR after these procedures should still be considered.

Study	Туре	Date	Conclusion
Martijn Tolsma, Tom A. Rijpstra, Peter M.J. Rosseel et al. Defining indications for selective chest radiography in the first 24 hours after cardiac surgery, The Journal of Thoracic and Cardiovascular Surgery, Volume 150, Issue 1, 2015,	I 102 patients On Demand vs standard CXR	2015	Defining clear indications for selective CXRs after cardiac surgery is effective and seems to be safe. This approach may significantly reduce the total number of CXRs performed, and will increase their efficacy.
Salehi, Mehrdad; Saberi, Kianoush ^{1,} ; Rahmanian, Mehrzad et al Assessment of Limited Chest X-ray Technique in Postcardiac Surgery Management. Annals of Cardiac Anaesthesia 20(1):p 38-41, Jan–Mar 2017.	Randomized study 978 patients Routine CXR upon admission + drains + on discharge vs. routine CXR on discharge to ward.	2017	Abolishing routine CXR in the ICUs would not be harmful for the patients, and it can be managed based on their clinical status and other safer imaging techniques (i.e. ultrasound where available)

RELEVANT RCOA GUIDELINES

- Chapter 18, Guidelines for the provision of anaesthetic services for cardiac and thoracic procedures, 2021
- No specific guidance.
- States that CXR, CT imaging modalities should be immediately available to post-operative cardiac surgical patients.

UK PRACTICE

- Survey through ACTACC
- 40 adult cardiothoracic centers in the UK (according to SCTS database)
- 15 responded (37.5% response rate)
- 11/15 order CXR's based on clinical indication only.
- Limitations \rightarrow
 - I. Generally more complicated patients at Harefield.
 - 2. Non responder bias \rightarrow centers trying novel approaches more likely to respond?

NEXT STEPS?

- Development & implementation of protocol
- Suggested approach
 - I. CXR once prior to discharge to ward, and 2nd CXR after chest drain removal.
 - 2. Further CXR's if clinical need arises (e.g. hypoxia, unexplained hypotension, unilaterally reduced breath sounds)
- Standarizes CXR's to 2. Reasonable compromise between too much and too little.
- Reaudit, screen for safety issues. If succesful, further bold steps may be taken..

THANK YOU FOR YOUR ATTENTION!



"Still, let's do an x-ray just to be sure."