

Diagnostic Imaging Pathways - Chest X-Ray (Pre-Operative)

Population Covered By The Guidance

This pathway provides guidance on the appropriate use of preoperative chest radiographs in adult patients.

Date reviewed: January 2012

Date of next review: 2017/2018

Published: January 2012

Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

Pathway Diagram

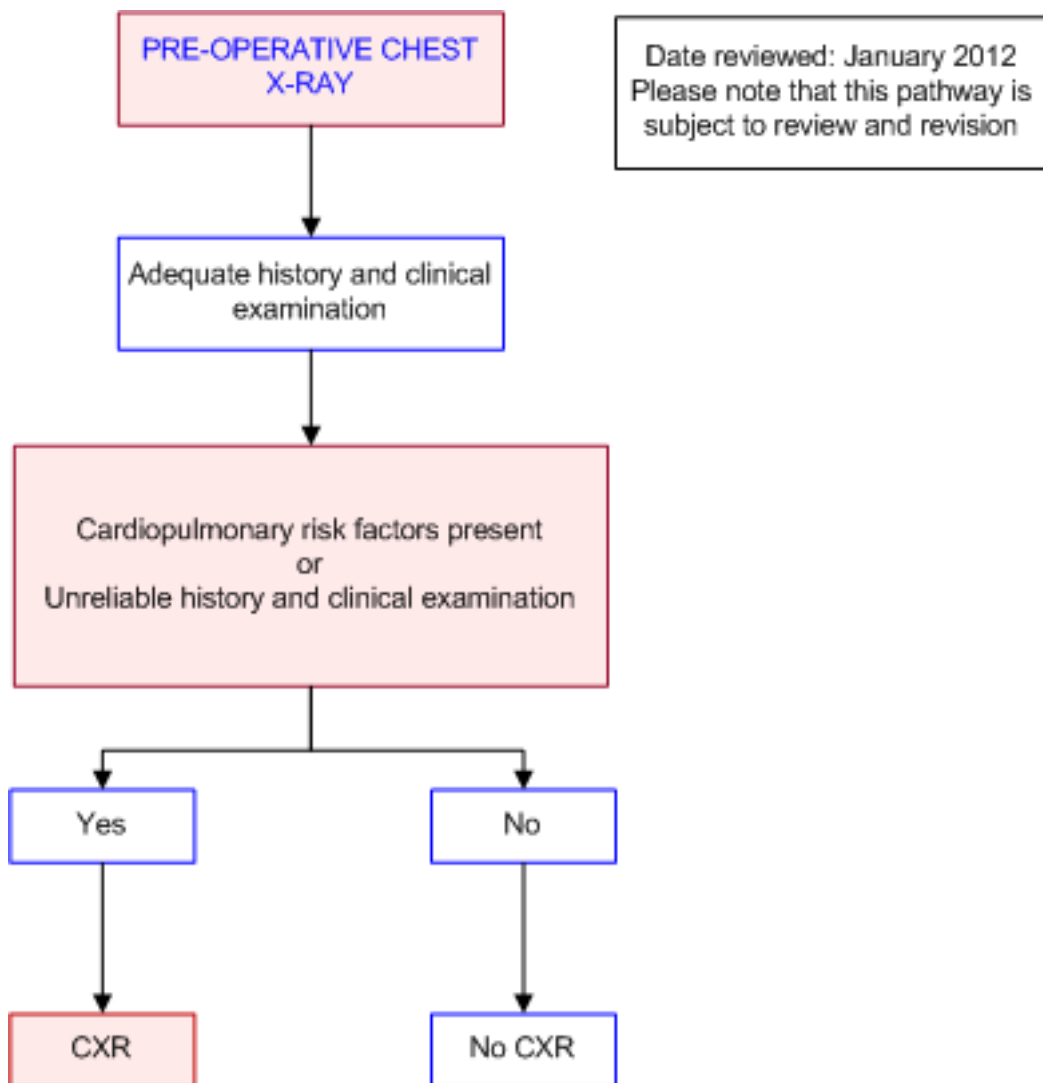


Image Gallery

Note: Images coming soon.

Teaching Points

- A preoperative CXR should be considered if the patient has, or is at risk of, cardiac/pulmonary disease or if a malignancy is suspected, after conducting a history and physical examination
- In addition, some surgeries may require a preoperative CXR. These include
 - All abdominal, thoracic and cardiac surgeries and some oesophageal surgeries
 - Thyroidectomy and other head and neck surgeries
 - Neurosurgeries
 - Lymph node surgeries

Routine Pre-operative Chest Radiograph



- Preoperative chest radiographs are usually requested to complete investigations in patients to detect asymptomatic abnormalities and to get some baseline imaging as well as for medico legal purposes [1,2](#)
- Drawbacks to the extensive use of routine preoperative testing are [2](#)
 - patient discomfort
 - unnecessary waiting times for some procedures
 - unnecessary direct costs and potential for unnecessary subsequent tests related to false-positive abnormal findings
- Over the past years there have been several studies that show routine chest radiographs to be useful only in AT RISK patients
- An association between preoperative screening radiographs and decrease in morbidity or mortality could not be established in the systematic review by Joo et al [10](#)
- Routine chest radiographs should not be performed for any patient without risk factors as there is good evidence supporting the low prevalence of chest radiograph abnormalities in this group [10](#)
- In a meta-analysis that included 21 reports, only 1.3% of films were unexpectedly abnormal; i.e. the abnormalities would not otherwise have been detected. These findings caused modification of management in only 0.1% [9](#)
- A recent randomized, single-blind, prospective, controlled pilot study showed that there was no increase in the perioperative adverse events as a result of no preoperative testing [12](#)
- Another prospective multicentre study indicated that in healthy, female, < 61 year-old patients, due for standard surgery, the probability of a useful preoperative chest radiograph ranges from 0.2% to 3.5%. The probability increases in male or elderly patients, or in the presence of coexisting respiratory diseases, or in ASA (American Society of Anesthesiologists' physical status classification) classes >2 [11](#)
- The pioneering study of the Swedish Council on Technology Assessment in Health Care from 1989 quantified the high degree of inappropriate use of preoperative tests for elective surgery. In a national survey of anaesthetists, 60 agreed that there was no scientific evidence to support widespread use of chest radiography in asymptomatic patients [4](#)

Indications For Pre-operative Chest Radiograph

- The Canadian Anaesthesiologists' Society suggests only performing preoperative chest radiography if a patient has, or is at risk of, cardiac / pulmonary disease or if a malignancy (with or without metastasis) is suspected, after conducting a history and physical examination [3](#)
- Other indications include (but are not limited to)
 - Immigrants from developing countries without a chest radiograph in the previous 12 months [5,6](#)
 - Long term smokers [5,7](#)
 - When there is any reason to doubt the reliability of the clinical examination or medical history (e.g. senility, intoxication, dementia, or linguistic or cultural barriers) [9](#)
 - Some types of surgery may require the need for a preoperative chest radiograph (i.e. non-generic preoperative testing). These include [8](#)
 - All abdominal, thoracic and cardiac surgeries and some oesophageal surgeries
 - Thyroidectomy and other head and neck surgeries
 - Neurosurgeries (due to prolonged anaesthesia and the need for intensive care after surgery)
 - Lymph node surgeries



References

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

1. Bouillot JL et al. **Are routine preoperative chest radiographs useful in general surgery? A prospective, multicentre study in 3959 patients. EAST practice management guidelines for trauma.** Eur J Surg. 1996;162(8):597-604. (Level II evidence)
2. Garca-Miguel F J , Serrano-Aguilar PG, Zlopez-Bastida J. **Preoperative assessment.** Lancet. 2003;362:1749-57. (Review article)
3. Merchant R , Bosenberg C, Brown K, Chartrand D, Dain S, Dobson J et al. **Guidelines to the practice of anesthesia.** J Can Anesth. 2010;57:58-87. (Level I evidence)
4. Harden CL et al. **Reassessment: neuroimaging in the emergency patient presenting with seizure (an evidence-based review). Report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology.** Neurology. 2007;69(18):1772-80. (Level I evidence)
5. Diaz JJ Jr, Cullinane DC, Altman DT, Bokhari F, Cheng JS, Como J et al. **Practice management guidelines for the screening of thoracolumbar spine fracture.** J Trauma. 2007;63(3):709-18. (Level II evidence)
6. Holmes JF, Panacek EA, Miller PQ, Lapidis AD, Mower WR. **Prospective evaluation of criteria for obtaining thoracolumbar radiographs in trauma patients.** J Emerg Med. 2003;24(1):1-7. (Level II evidence)
7. Calendine CL, Fajman WA , Hanna SL, Tigges S. **Is there need for thoracic spine radiographs following a negative chest CT in trauma patients?** Emerg Radiol. 2002;9(5):254-6. (Level III evidence)
8. Reinus WR, Strome G, Zwemer F. **Use of lumbosacral spine radiographs in a level II emergency department.** AJR Am J Roentgenol. 1998;170:443-7. (Level III evidence)
9. Archer C, Levy AR, McGregor M. **Value of routine preoperative chest x-rays: a meta-analysis.** Can J Anaesth. 1993;40(11):1022-7. (Level I evidence). [View the reference](#)
10. Joo HS, Wong J, Naik VN, Savoldelli GL. **The value of screening preoperative chest x-rays: a systematic review.** Can J Anaesth. 2005;52(6):568-74. (Level I evidence). [View the reference](#)
11. Silvestri L, Maffessanti M, Gregori D, et al. **Usefulness of routine pre- operative chest radiography for anaesthetic management: a prospective multicentre pilot study.** Eur J Anaesthesiol. 1999;16:749-60. (Level II evidence). [View the reference](#)
12. Chung F, Yuan H, Yin L, Vairavanathan S, Wong D. **Elimination of preoperative testing in ambulatory surgery.** Anesth Analg. 2009;108(2):467-75. (Level I evidence). [View the reference](#)

Information for Consumers

Information from this website	Information from the Royal Australian and New Zealand College of Radiologists' website
Consent to Procedure or Treatment Radiation Risks of X-rays and Scans	Plain Radiography/X-rays Radiation Risk of Medical Imaging During



[Chest Radiograph \(X-ray\)](#)

[Pregnancy](#)

[Radiation Risk of Medical Imaging for
Adults and Children](#)

Copyright

© Copyright 2015, Department of Health Western Australia. All Rights Reserved. This web site and its content has been prepared by The Department of Health, Western Australia. The information contained on this web site is protected by copyright.

Legal Notice

Please remember that this leaflet is intended as general information only. It is not definitive and The Department of Health, Western Australia can not accept any legal liability arising from its use. The information is kept as up to date and accurate as possible, but please be warned that it is always subject to change

File Formats

Some documents for download on this website are in a Portable Document Format (PDF). To read these files you might need to download Adobe Acrobat Reader.



[Legal Matters](#)