

# 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.

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## Quick User Guide

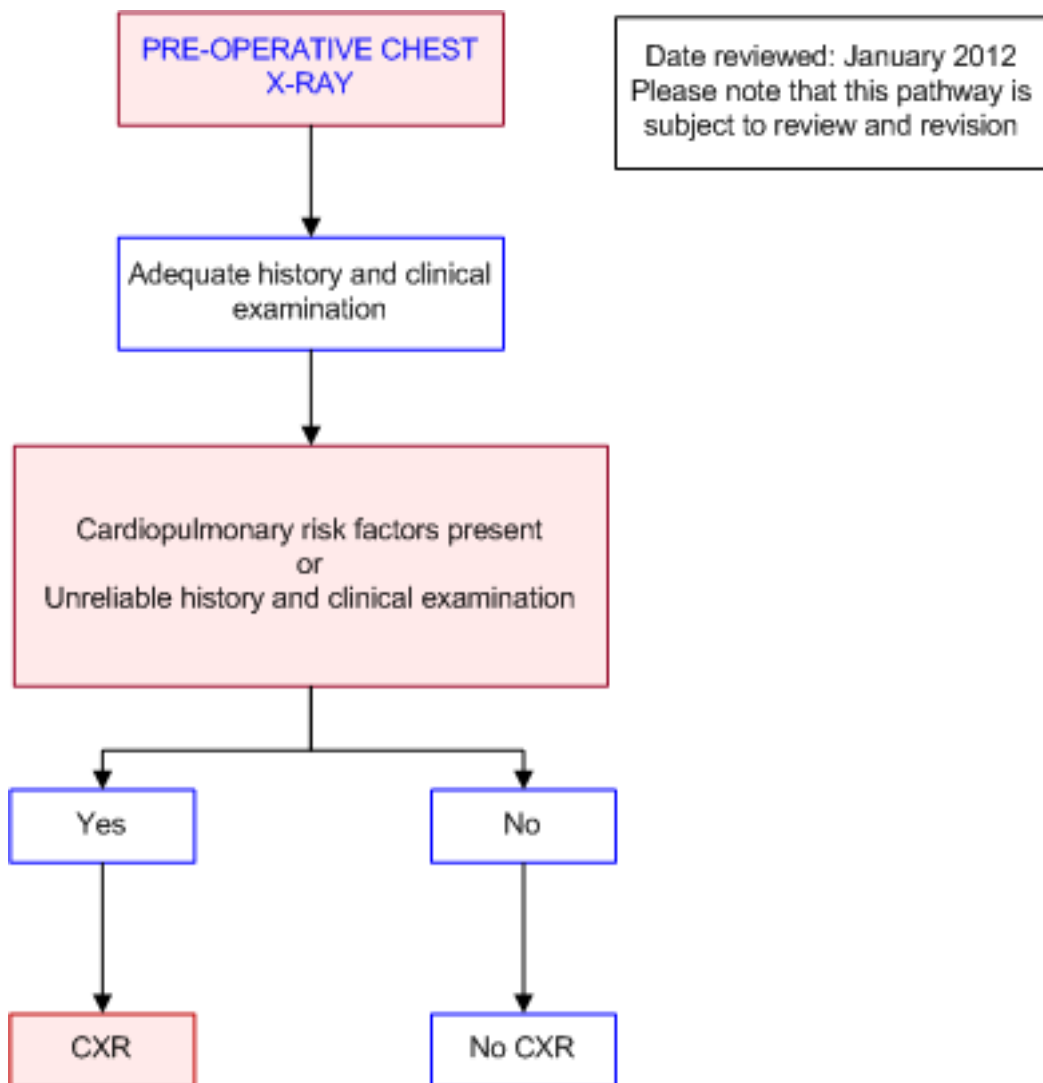
Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

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](#)

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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)
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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)
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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](#)
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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](#)

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