

Order Fewer Chest X-rays

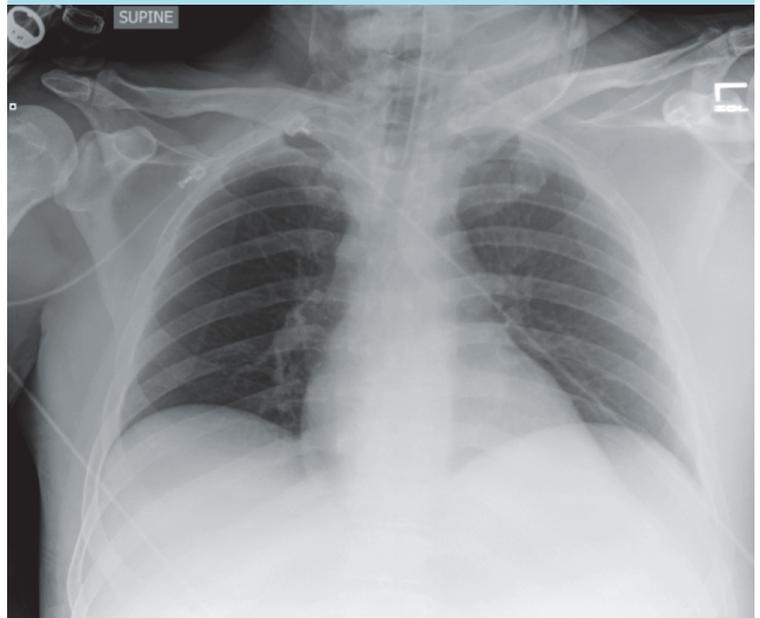
Three Ways to Choose Wisely:

1 In the ICU: The Critical Care Societies Collaborative **recommends against ordering daily chest x-rays without a clinical indication.**

2 Pre-op: The American College of Radiology **recommends avoiding pre-operative chest x-rays for ambulatory patients with unremarkable history and physical exams.**

3 New admissions: The American College of Radiology **recommends obtaining chest x-rays if you suspect acute cardiopulmonary disease or in a patient older than 70 with chronic stable cardiopulmonary disease who does not have a recent x-ray.**

Each day more than half of ICU patients at VUMC receive a CXR.



The average daily cost of CXRs in ICUs at VUMC is more than \$1,500.

References:

1. Choosing Wisely Top Five List of the Critical Care Societies Collaborative <<http://www.choosingwisely.org/wp-content/uploads/2014/01/SCCM-5things-List-012014.pdf>> accessed February 15, 2015
2. Ganapathy A, Adhikari NK, Spiegelman J, Scales DC. Routine chest x-rays in intensive care units: a systemic review and meta-analysis. Crit Care. 2012;16(2):R68.
3. Choosing Wisely Top Five List of the American College of Radiology <http://www.choosingwisely.org/wp-content/uploads/2013/01/5things_12_factsheet_Amer_Coll_Radiology.pdf> accessed February 15, 2015
4. Mohammed TL et al, Expert Panel on Thoracic Imaging. ACR Appropriateness Criteria® routine admission and preoperative chest radiography. [Online publication]. Reston (VA): American College of Radiology (ACR); 2011

Frequently Held Misconceptions



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1 My ICU patient needs a chest x-ray (CXR) every morning regardless of clinical status.

Not necessarily. A meta-analysis of 9 studies showed no difference in mortality, ICU length of stay, or duration of mechanical ventilation in patients who received CXRs only based on clinical changes vs. those receiving routine, daily CXRs.¹ Other studies have shown a 32-45% reduction in CXR orders with no change in patient outcomes.²⁻³

2 In the majority of cases my morning chest x-ray changes management.

Quite the opposite. A good rule is to always order a CXR to answer a clinical question. One study, conducted in an ICU, found that when performing routine, daily CXRs, only 5.5% of radiographs resulted in changes in management.⁴

3 There is no harm in routine, daily CXR's in ICU patients.

False. The costs to patients include unnecessary work-ups of false positive results, excess radiation exposure, dislodged lines and endotracheal tubes during repositioning, and money (\$24 per CXR). It also takes away resources from support staff needed to evaluate more unstable patients.

4 Every patient needs a chest x-ray before surgery.

Not the case. Patients with history or physical exam findings suggestive of cardiopulmonary disease or patients over age 70 without a CXR in the preceding six months may benefit from a pre-op CXR.⁵

5 I will miss something by not ordering a routine, morning chest x-ray on my intubated patient.

It's unlikely. While most patients have a clinical indication for a CXR in the first 48 hours after intubation, patients ventilated >48 hours are unlikely to benefit from routine imaging. One study found only a 0.7% risk of delayed diagnoses among patients not receiving routine CXRs; most of the delayed diagnoses were mal-positioned NG tubes.⁴

References:

- ¹ Ganapathy A, Adhikari NKJ, Spiegelman J, Scales DC. Routine chest x-rays in intensive care units: A systematic review and meta-analysis. *Crit Care*. 2012;16(2):R68.
- ² Hejblum G, Chalumeau-Lemoine L, Ioos V, Boëlle PY, Salomon L, Simon T, Vibert JF, Guidet B. Comparison of routine and on-demand prescription of chest radiographs in mechanically ventilated adults: a multicentre, cluster-randomised, two-period crossover study. *Lancet*. 2009 Nov 14;374(9702):1687-93.
- ³ Graat ME, Kröner A, Spronk PE, Korevaar JC, Stoker J, Vroom MB, Schultz MJ. Elimination of daily routine chest radiographs in a mixed medical-surgical intensive care unit. *Intensive Care Med*. 2007 Apr;33(4):639-44.
- ⁴ Clec'h C, Simon P, Hamdi A, Hamza L, Karoubi P, Fosse JP, Gonzalez F, Vincent F, Cohen Y. Are daily routine chest radiographs useful in critically ill, mechanically ventilated patients? *Intensive Care Med*. 2008 Feb;34(2):264-70.
- ⁵ Mohammed TL et al, Expert Panel on Thoracic Imaging. ACR Appropriateness Criteria® routine admission and preoperative chest radiography. Reston (VA): American College of Radiology (ACR); 2011