

## Routine daily chest x-ray in the ICU. *Time to cut down*

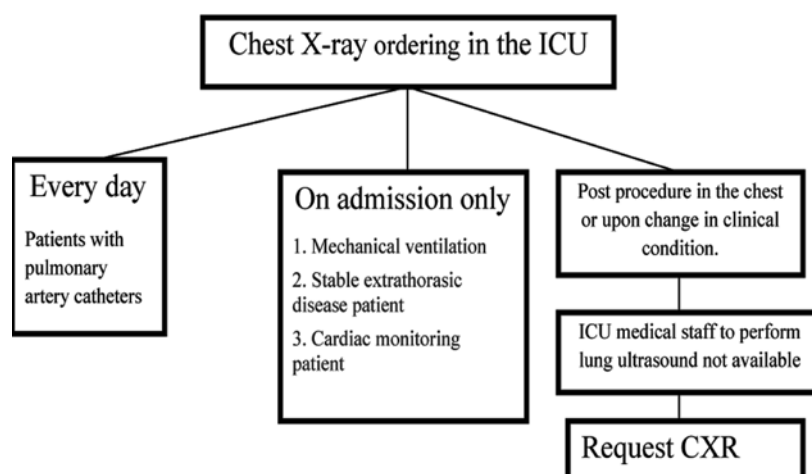
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Routine daily chest radiography (CXR) is common in intubated and mechanically ventilated patients. A key justification is the belief that routine chest radiographs allow prompt detection of problems that could be missed by clinical evaluation, such as early pneumothoraxes, or malpositioned endotracheal tubes. Results of a previous study<sup>1</sup> suggested that these abnormalities are relatively minor and unlikely to alter major clinical outcomes of intensive care unit (ICU) patients. Thus, the practice of daily routine CXR has been scrutinized. However, the practice of daily routine CXR in the ICU continues. In a randomized clinical trial, Hejblum et al<sup>2</sup> found that an on-demand approach reduced CXR by 32% for ICU patients ( $p < 0.0001$ ). They demonstrated that the on-demand approach produced the same number of diagnostic or therapeutic interventions as the routine approach. It also did not increase the duration of mechanical ventilation, length of ICU stay (LOS), or mortality. These findings provide good evidence that routine daily chest radiographs are unnecessary in most intubated and mechanically ventilated patients.

In a meta analysis by Oba and Zaza,<sup>3</sup> pooled analysis of on-demand and daily routine CXR in 7,078 patients

revealed that the elimination of daily routine CXR did not affect hospital or ICU mortality, ICU LOS, or ventilator days. This study was conducted by the Division of Pulmonary and Critical Care Medicine, University of Missouri, Columbia on 2010. The regression analyses failed to identify any subpopulation that would benefit from daily routine CXR in the ICU. However, previous studies have identified 2 subpopulations that might benefit from daily routine CXR.<sup>3</sup> These are: unstable pulmonary and cardiac patients; and patients with pulmonary artery catheters. Moreover, Graat et al<sup>4</sup> conclude in his study that the therapeutic and diagnostic values for on-demand CXR's was higher compared to daily routine ones. Similarly, Clech et al<sup>5</sup> have demonstrated that restrictive use of CXRs in mechanically ventilated patients is associated with better diagnostic and therapeutic efficacies without impairing outcome. Alternative techniques to CXRs like ultrasonography and capnography have less cost than CXR, and have less time to performance compared to CXR study. They could be used to ensure correct position of enteral feeding tubes, diagnosing and monitoring pulmonary conditions, as well as post insertion of central venous catheter.<sup>6</sup>

Variability of clinical situations (with each situation possibly requiring a specific CXR-ordering strategy) in the ICU is a major obstacle to analysis of data from previous studies.<sup>7</sup> In addition, the definitions of terms, such as routine and clinical significance may vary across studies. Such facts make multicenter prospective study on the efficacy of performing routine CXRs in different



**Figure 1** - Chest x-ray ordering strategy in the intensive care unit (ICU). CXR - chest x-ray

situation in adult ICUs not feasible. Until such study is available, and based on our review of current best available evidence, we can summarize the acceptable indications for ordering chest x-ray in the ICU as in **Figure 1**.

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