

PERSPECTIVE

LESS IS MORE

Preoperative Chest X-rays
A Teachable Moment

**Meredith A. Niess,
MD, MPH**

University of Colorado
School of Medicine,
Aurora.

**Allan Prochazka, MD,
MSc**

Department of
Ambulatory Care,
Denver VA Medical
Center, Denver,
Colorado.



Editorial

Mr X, a man in his mid 50s with a history of mild intermittent asthma and an increasingly painful umbilical hernia, presented to a general surgery clinic for a preoperative evaluation. Basic laboratory test results and cardiopulmonary examination findings were normal, and a reducible hernia was noted. A chest radiograph (CXR) was obtained for the indication of preoperative evaluation in a patient with asthma older than 55 years. The CXR revealed a 7-mm left perihilar lung nodule, with a radiologist recommending further evaluation of the lung with computed tomography (CT). As a result, hernia surgery was delayed and CT scan of the chest was undertaken.

Four weeks later, Mr X followed up to review the results of his CT scan, which revealed no pulmonary nodule but revealed a right adrenal nodule. The radiologist recommended that dedicated adrenal CT imaging be ordered by the medical team, further delaying surgery. Adrenal CT revealed findings consistent with a benign adenoma. Hernia repair was finally completed more than 6 months after his preoperative evaluation. Throughout this time, Mr X noted persistent pain from his hernia and anxiety over the positive test results.

The value of preoperative CXR has never been established. The Royal College of Radiology examined the utility of preoperative CXR in 8 hospitals and 10 619 patients in 1979. It concluded, "In view of the absence of clinical usefulness of routine [preoperative CXR] in... nonemergency operations," there was widespread overuse, and "the policy of abandoning routine [preoperative CXR]... should be discussed."¹ Since that time, little evidence has surfaced to support preoperative CXR, but the practice continues. Recently, the Choosing Wisely campaign identified preoperative CXR as a priority area to raise awareness of its overuse.²

Assessing the utility of this screening method requires estimating what fraction of CXRs have unexpected findings that prove useful in management. Most studies define a CXR-related change in management as delay or cancellation of surgery or a change in anesthesia protocol, neither of which have been shown to lead to better patient outcomes.

Existing studies on changes in anesthesia management do not include randomized controlled trials; they are predominantly retrospective trials. Reviews of the topic consistently cite the same nonblinded and nonrandomized

studies. Silvestri et al³ conducted the largest multicenter study to date (6111 patients). Patients undergoing elective surgery who had submitted to a preoperative CXR at the surgeon's discretion were enrolled. Anesthesiologists were interviewed after the surgical procedure and asked whether preoperative CXR changed management. Results showed that preoperative CXR resulted in a revision of anesthesia management from 0% to 13.5% of the time depending on the anesthesiologist questioned. Given the nonblinded, retrospective format of the survey, these results are prone to bias; the variability in responses is more consistent with the variability of anesthesiology preference than useful predictors of the utility of preoperative CXR.

In the absence of better evidence, the American Society of Anesthesiologists (ASA) stated in 2001, "[the ASA] does not believe that extremes of age, smoking, stable COPD [chronic obstructive pulmonary disease], stable cardiac disease, or resolved recent upper respiratory infection should be considered unequivocal indications for chest radiography."⁴

In 2005, Joo et al⁵ published a systematic review of 14 articles evaluating the practice of preoperative CXR. Although this review considered the same nonrandomized, nonblinded, largely retrospective trials referenced earlier in this article, the authors took into account the quality of the evidence and concluded that routine preoperative CXR should not be performed in asymptomatic patients. By their assessment, most abnormalities are chronic, are expected, or do not affect management or postoperative outcome.⁵

Despite the evidence that preoperative CXR is unlikely to be beneficial, it continues to be used in daily practice. Exposing a patient to multiple additional studies prolongs surgical delay, increases exposure to radiation, prolongs and exacerbates underlying anxiety, and increases the likelihood of additional incidentalomas. The existing studies would likely label Mr X's case a success; preoperative CXR had identified an unexpected abnormality that changed management by delaying surgery. However, a closer look at an individual case such as Mr X's may actually illustrate a less rosy view of the consequences of preoperative CXR. He had more than 100 times the radiation of a single CXR, anxiety due to multiple incidental findings, and one objective patient-oriented outcome—delay in the management of his painful hernia.

Corresponding

Author: Meredith A. Niess, MD, MPH, Internal Medicine Residency Program, University of Colorado School of Medicine, 12631 E 17th Ave, B177, Aurora, CO 80045 (meredith.niess@ucdenver.edu).

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