

Online Supplementary Material

van Vugt S, Broekhuizen L, Zuithoff N, et al. Incidental findings on chest radiographs in adult primary care patients with acute cough. *Ann Fam Med*. 2012;10(6):510-515.

<http://www.annfammed.org/content/full/10/6/510>

Supplemental Appendix 1. Standard Operating Procedure (SOP) for the Assessment and Feedback of Chest Radiographs

As indicated on the GRACE Chest Radiograph Requisition Form, the following questions should be answered regarding each chest radiograph:

F. Date chest radiograph -- / -- / ----
Day Month Year

G. Chest radiograph sufficient quality? ☐ Yes: ☐ No:

H. Consolidation ☐ Yes: ☐ No:

If yes: ☐ Right: ☐ Left:

I. Pleural effusion ☐ Yes: ☐ No:

J. Interstitial pattern/infiltrate ☐ Yes: ☐ No:

K. Diagnosis ☐ Normal findings on chest radiograph
 ☐ Acute bronchitis
 ☐ Bronchopneumonia
 ☐ Lobar pneumonia
 ☐ Other, please specify:.....

L. Other remarks:

As indicated in the GRACE protocol the following definitions should be used when answering these questions:

A. Consolidation: a dense or fluffy opacity that occupies a portion or whole of a lobe or of the entire lung that may or may not contain air bronchograms

B. Pleural effusion: fluid in the lateral pleural space and not just in the minor oblique fissure

C. Interstitial pattern/infiltrate:

C1: a lacy pattern involving both lungs featuring peribronchial thickening and multiple areas of atelectasis.

C2: minor patchy infiltrates that are not of sufficient magnitude to constitute primary end-point consolidation and small areas of atelectasis that may be difficult to distinguish from consolidation.

The results of the chest radiograph should be send immediately to the general practitioner if consolidation (A), pleural effusion (B), or infiltrate as described under C1 is present. All other categories of results should not be communicated to the general practitioner, unless the patient or the general practitioner stops participation of the patient in the study. Also if radiographic changes suggestive of a neoplastic lesion or other major abnormalities are seen, the general practitioner should be informed immediately. The general practitioner should stop participation in the intervention trial/WP10 (NOT the observational study/WP9) when the chest radiograph shows consolidation (A), pleural effusion (B), or infiltrate as described under C1.

Supplemental Appendix 2. Clinical Relevance, Defined by Clinical Judgment and Literature

An incidental finding in human subjects research is defined in a major consensus project as an observation "concerning an individual research participant that has potential clinical importance and is discovered in the course of conducting research, but is beyond the aims of the study."¹

Relevant

- **Suspected nodules, density or shadow.** Always further investigation with computed tomography to exclude potential malignancy.
- **Aortic dilatation.** Could be aneurysm.
- **Hilar/mediastinal enlargement.** Several causes: infection or inflammation (sarcoidosis) pulmonary hypertension, malignancy (eg, lymphoma, struma, metastasis). Further investigation is necessary.^{2,3}
- **Interstitial lung disease.** Needs further investigation by pulmonologist if unknown. Several interstitial lung diseases are progressive.

Probably relevant

- **Spinal fracture/collapsed vertebrae.** Several studies have found incidental vertebral fractures on chest radiographs as an important sign of osteoporosis and opportunity for proper osteoporosis management to prevent fractures. If osteoporosis is excluded, rarer causes, such as multiple myeloma or metastasis, should be excluded.
- **Pleural fluid.** Many possible causes. Unilateral pleural fluid needs a diagnosis, bilateral can be cardiac failure. Pleural aspiration can reveal the cause, eg, cardiac decompensating, pneumonia, empyema, pancreatitis, cirrhosis hepatic, malignancy.
- **Cardiomegaly or pulmonary congestion.** Controversy exists regarding the diagnostic value for cardiac failure.^{4,5} Medical treatment for cardiac failure may be started. In young patients with fever, think about myocarditis/pericarditis.
- **Signs of COPD and asthma.** Sensitivity of early obstruction and hyperinflation is low (around 50%) for detection of chronic obstructive lung disease. Probably, many cases in this group will be either false-negative cases or more severe and longstanding obstructive lung disease, which will be known (and treated accordingly) by the general practitioner already.

Probably not relevant

- **Calcifications (aortic/vascular/lymph node).** Cardiovascular risk assessment can be considered.
- **Scoliosis, pectus excavatum.**
- **Degenerative spinal changes.** Vertebral abnormalities, other than fractures. Sign of aging.
- **Elongated aorta.** Often mentioned, but irrelevant finding, because aorta elongation is a physiological sign of increasing age.
- **Pleural abnormalities.** Often a sign of an occupational disease, with or without additional asbestos exposure. Exposure to asbestos is important to know.
- **Scars, etc:** eg, adhesions, granuloma, atelectasis. Most often signs of previous infection, such as tuberculosis.
- **Other:** eg, situs inversus, additional ribs on right side, breast implants, thyroid nodules, elevated hemidiaphragm, splenic cyst.
- **Pacemaker.**
- **Technical issue:** eg, poor inspiration, overlying breast tissue, rotated patient. Information on the reliability of the reported radiographic findings.
- **Hiatus hernia:** start reflux treatment, if patient is suffering.

References

1. Wolf SM, Lawrenz FP, Nelson CA, Kahn JP, Cho MK, Clayton EW et al. Managing incident findings in human subjects research: analysis and recommendations. *J Law Med Ethics*. 2008;36(2):219-48, 211.
2. Swensen SJ, Brown LR. Conventional radiography of the hilum and mediastinum in bronchogenic carcinoma. *Radiol Clin North Am*. 1990; 28(3):521-538.
3. Whitten CR, Khan S, Munneke GJ, Grubnic S. A diagnostic approach to mediastinal abnormalities. *Radiographics*. 2007;27(3):657-671.
4. Nielsen OW, Hansen JF, Hilden J, Larsen CT, Svanegaard J. Risk assessment of left ventricular systolic dysfunction in primary care: cross-sectional study evaluating a range of diagnostic tests. *BMJ*. 2000;320(7229):220-224.
5. Badgett RG, Mulrow CD, Otto PM, Ramirez G. How well can the chest radiograph diagnose left ventricular dysfunction? *J Gen Intern Med*. 1996;11(10):625-634.