The correct answer is C. Serial chest radiography. This question can be found in MKSAP 16 in the Pulmonology and Critical Care section, item 8.

The most appropriate next step in management is serial chest radiography. This patient presents with a small, spontaneous pneumothorax in the setting of known COPD. The pneumothorax is therefore classified as a secondary spontaneous pneumothorax. In this case, there is less than 2 cm between the chest wall and lung, and it is reasonable to observe the pneumothorax with serial chest radiography rather than intervene at this time. Given the decreased respiratory reserve and higher likelihood of progression and mortality in this patient group when compared with patients without known underlying structural lung disease (primary spontaneous pneumothorax), observation should be performed in the inpatient setting.

If a persistent air leak is noted after 3 to 5 days, it is reasonable to consider definitive treatment of the pneumothorax. Definitive management to prevent recurrence typically consists of chemical pleurodesis via thoracostomy (which is shown to reduce recurrence to 25%) or thoracoscopic repair with pleurodesis (which reduces recurrence to approximately 5%).

Needle aspiration is an option for treating secondary pneumothoraces, but it has been shown to be significantly less effective than tube thoracostomy in patients requiring therapeutic intervention.

If at any time the pneumothorax increases to greater than 2 cm, a small-bore chest tube should be placed, because the patient is experiencing dyspnea.

Key Point
- For secondary spontaneous pneumothoraces, outpatient management is discouraged; even small (<2 cm) pneumothoraces are more safely observed in the inpatient setting.