Introduction Spontaneous pneumothorax (SP) is common, with an estimated incidence of 5,000 per year in the UK. Primary spontaneous pneumothorax (PSP) can be managed with needle aspiration initially but those who fail to re-expand, and the majority of secondary SP (SSP), require admission to hospital, insertion of a chest drain and connexion to a bulky underwater drainage system. Patients with SSP have greater co-morbidities; have a long hospital stay (14–16 days) and a mortality of ~16%. There are no good predictors of outcome for patients with pneumothorax: those who will respond to drainage, those who have persistent air leak and those who will require surgery. Significant early air leak could be indicative of those patients who will not resolve spontaneously and will require surgery.

Aim To determine whether air leak measurement can predict patient outcome (surgical referral rate).

Methods Between December 2012 and June 2013, patients with pneumothorax managed on the Respiratory Ward of a tertiary referral centre had their “air leak” measured using a digital suction device (Thopaz, Medela UK).

Results A total of nine patients (6 SSP, 2 PSP, and 1 iatrogenic) were investigated. Air leak was measured during their in-patient stay: median of 3.5 days after admission (range 1–16 days). Three (33%) were referred for surgical intervention for continued air leak and pneumothorax: their average air leak was 504 ml/min (range 222–952 ml/min) compared to 77 ml/min (range 1–225 ml/min) for the six patients not referred. The 427 ml/min difference was not statistically significant (p = 0.2) with this sample size.

Conclusion At present, there are no good predictors of outcome for patients with pneumothorax. Air leak measurement post-drain insertion may be useful surrogate marker for on-going leak and hence non-resolving pneumothorax. This pilot study showed a difference in early leak measurement between those patients who were ultimately referred for surgery and those spontaneously resolving, and further larger studies are now warranted, comparing air leak to clinically important outcomes in pneumothorax.