



Site Protocol

Background

Spontaneous pneumothorax (PTX) remains common in the UK accounting for an admission rate of 14.1 per 100,000 population¹. Overall incidence is higher with many not requiring admission with a recent trial supporting conservative management of large primary spontaneous pneumothorax (PSP) if minimally symptomatic². Inpatient management of spontaneous pneumothorax varies and chest drains are frequently inserted to treat those symptomatic or with known chronic lung disease.

Recurrence within 7-days requiring readmission remains problematic with rates between 4.1-6.7% depending on sex and presence of chronic lung disease¹. One technique that respiratory physicians utilise to reduce recurrence is a trial of clamping the chest drain to mimic removal to detect subtle air leaks with a chest X-ray (CXR) performed after to assess. This practice divides opinion with a survey of American College of Chest Physicians members stating 47% clamped drains in PSP and 59% did so in secondary spontaneous pneumothorax (SSP)³. British Thoracic Society (BTS) guidance makes no recommendation on clamping given the lack of evidence to support or refute this practice⁴. One retrospective audit in Hong Kong demonstrated clamping was safe and prevented further procedures in 12% of cases⁵.

Digital pleural drainage devices, such as Thopaz+™, have widely been adopted following lung resection to quantify air leak and reduce the need for clamping trials, but its uptake remains limited to surgical settings with no significant difference in length of stay when applied in PSP⁶⁻⁸. Although digital air leak monitoring could theoretically reduce inappropriate early chest drain removal, its cost remains a limiting factor to its widespread adoption.

We aim to assess whether chest drain clamping trials are commonly performed in the UK and whether they are associated with significant clinical impacts including pneumothorax recurrence, length of stay and adverse events.

Population: Patients who have had a chest drain inserted to manage a PSP or SSP, and are managed on a ward with nursing staff who have been appropriately trained to manage chest drains during the period 01/05/2021-31/10/2023

Inclusion criteria: Patients with an intercostal drain inserted to manage PSP or SSP
Air leak that has persisted for over 24 hours based on clinical assessment

Exclusion criteria: Traumatic pneumothorax
Iatrogenic pneumothorax
Air leak following thoracic surgery
Chemical pleurodesis during admission
Autologous blood pleurodesis during admission
Aged <16 years

Patient numbers: ~250 across anticipated across >15 centres (27 cases initially collected from CUH) – promoted via British Thoracic Society INSPIRE network

Methods: Data will be collected locally by site leads undertaking retrospective review of notes and then entered into REDCap, a dedicated, purpose-built secure web-based application. Details collected for each pneumothorax case will include non-identifying patient demographic details (age, sex), laterality of PTX, timing of chest drain insertion, whether clamping was performed, time to chest X-ray, decision about chest drain removal, time to chest drain removal, length of stay, adverse effects, recurrence, further interventions required (up to day 30). For patients managed with digital suction devices, data regarding air leak at time of drain removal will also be collected. Statistical analysis will be performed by the lead authors after completion of data collection, in April 2024.

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References:

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- 3 Baumann MH, Strange C, Heffner JE, Light R, Kirby TJ, et al. Management of spontaneous pneumothorax, An American College of Chest Physicians Delphi Consensus Statement. *Chest*. 2001;199(2):590-602.
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- 6 Thopaz+ portable digital system for managing chest drains (2018), NICE guidelines MTG37. Last updated 6 June 2022.
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- 8 Ruigrok D, Kunst PWA, Blacha MMJ, Tomlow B, Herbrink JW, et al. Digital versus analogue chest drainage system in patients with primary spontaneous pneumothorax: a randomised controlled trial. *BMC Pulmonary Medicine*. 2020;20:136.