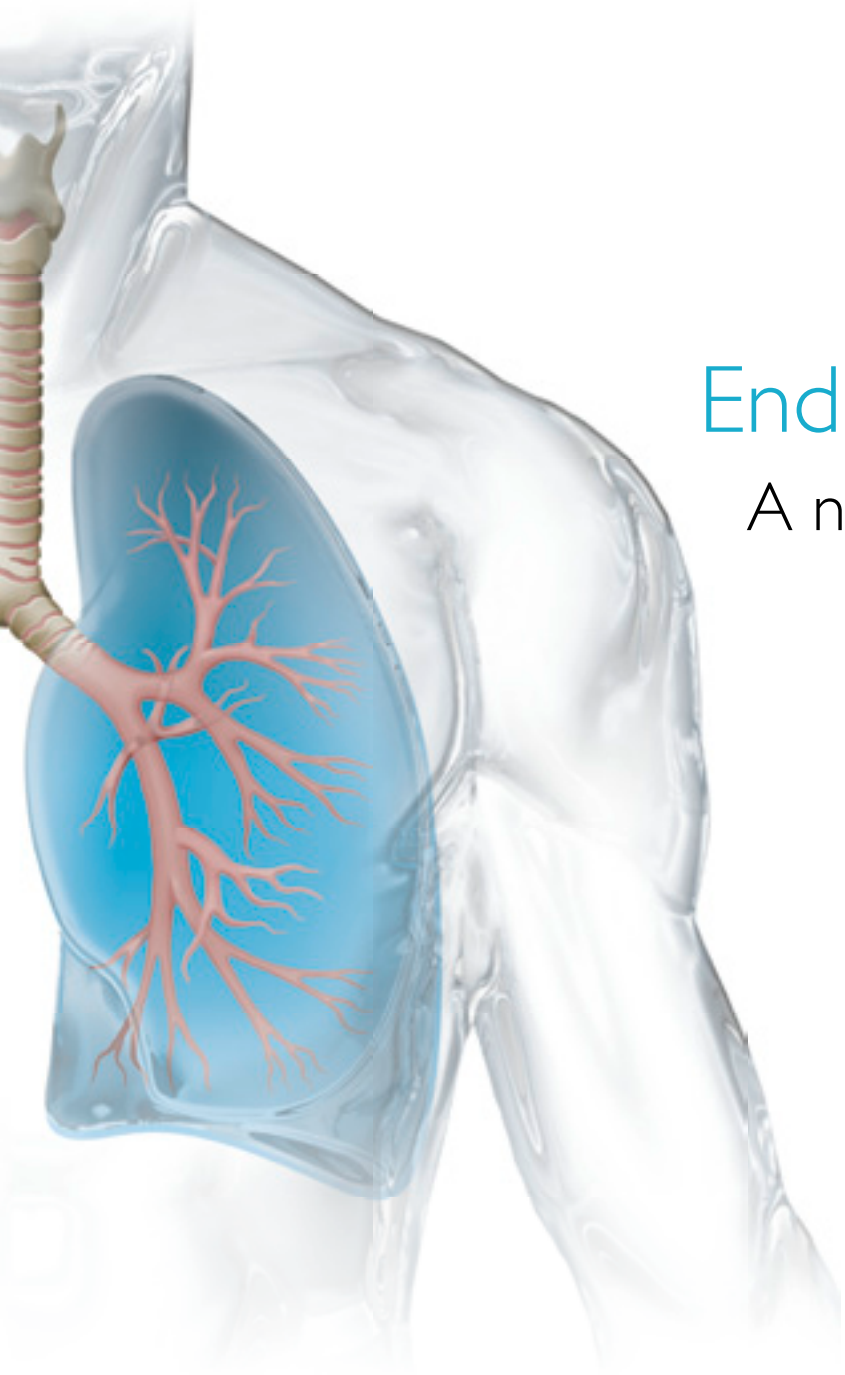
pulmonX
Interventional Pulmonology®



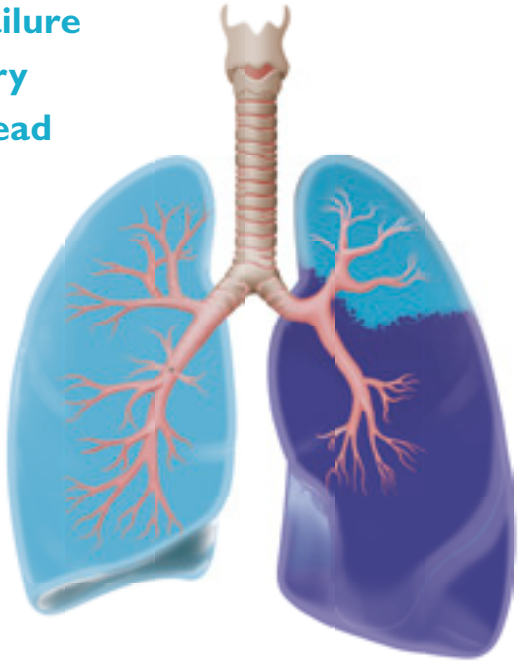
Endobronchial Valves

A new solution for treating persistent air leaks

Zephyr®
Endobronchial Valve

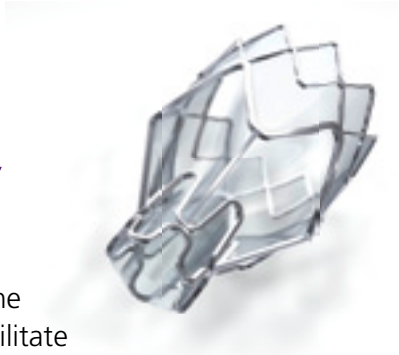
A Novel Approach to Treat Air Leaks

Data suggests air leaks may occur owing to the failure to fully seal lung tissue in up to 15% of lung surgery cases.[1] Leakage of air into the pleural space can lead to breathing difficulties and collapsed lungs.[2] Other causes of air leaks can include underlying pulmonary diseases, trauma, and spontaneous pneumothorax.[3] Spontaneous pneumothorax occurs more frequently in patients with severe COPD.[4] Other risk factors include diabetes, smoking, poor nutritional status and other underlying lung diseases.[5]



Once an air leak develops, it is possible to persist and worsen.[3] Patients with persistent pneumothorax have significant comorbidities as shown by high American Society of Anesthesiologists scores.[6] Complications of persistent pneumothorax can include pneumonia, empyema and fever.[7] Patients with persistent pneumothorax therefore generally require extensive hospitalisation and resources, have a poor prognosis for surgery and have an urgent medical need for non-invasive techniques.[1,2,9,10]

Zephyr to Block Air Flow



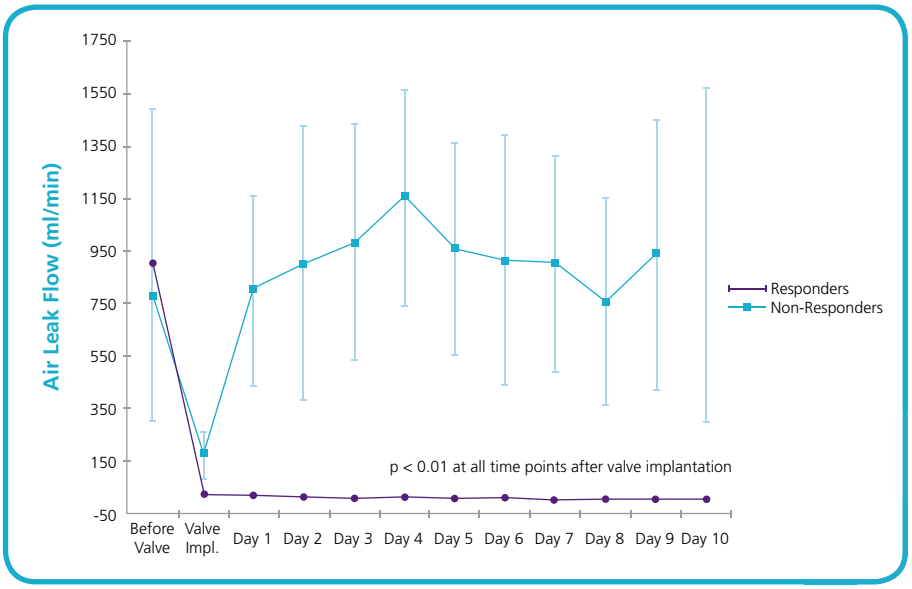
Once located, the air leak can be treated by implanting Endobronchial valve(s) (EBV(s)) using a delivery catheter.[12] The Zephyr EBVs block airflow to the area of leak in order to facilitate healing and allow the removal of chest tubes and patient discharge.[3,12] Zephyr valves are easily removed using a bronchoscope.[9]

Clinical efficacy & safety

EBVs have been broadly utilized as a treatment option in this population resulting in a number of peer reviewed publications.[1,8,9,11,13,14]

A series of 40 patients with persistent pneumothorax published in CHEST showed immediate improvement in 93 % of patients receiving Zephyr EBV.[1] Complete cessation of air leak was seen in 48 % of patients.

Another study looked at 16 patients with persistent pneumothorax (>7 days, various etiologies) who had not responded to standard treatment.[9] Here again 77 % (10/13) of patients responded to valve therapy and mean air flow fell immediately from 871 ± 551 ml/min to 61 ± 72 ml/min when valves were implanted (see figure).

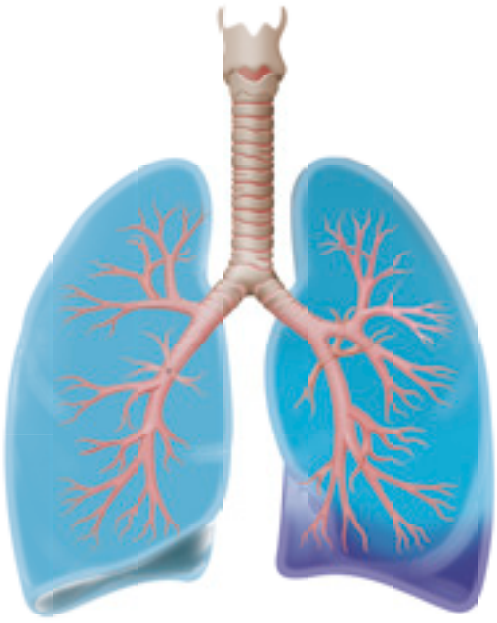


Mean air leak flow before and after valve implantation in a series of 16 patients non-responsive to standard treatment.

Mean implantation time was 30 ± 5 min to the end of the bronchoscopy.[9] Valves were implanted in all lobes with equal efficacy.[1,9]

EBVs are safe to use. In the two studies mentioned above, there were a total of 6 adverse events seen up to 42 months.[1,9] None of the events was related to valve placement.

EBVs can remain in place, or can be removed without recurrence of pneumothorax. In the studies above, valves were removed from 15/56 patients, with no further complications.[1,9]



Treatment algorithm[1]

1 Localize location of air leak

2 Place EBVs in all segments feeding the air leak

3 Look for reduction/cessation of the leak

4 Removal of chest tube(s)

5 Removal of valves based on clinical judgement

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