was administered pre-trial based on clinical examination. The trial was completed by a competent respiratory physiotherapist requiring >6 months post-qualification experience that included completion of a respiratory rotation. The trial process usually takes up to 2 hours in total. All measures were repeated immediately after the trial, including FEV₁, and the change was calculated using a percentage change equation (Equation 1).

A failure of the inhalation therapy trial was classified as a FEV₁ drop greater than 15% from initial FEV₁ (British Thoracic Society 1997). Patients that failed an inhalation therapy trial were treated with salbutamol and assessed by the physiotherapist, with all measurements repeated; and the protocol was that examination by a medic would be requested if the patient did not return to base line observations and spirometry within 20 minutes of completing the trial.

\[
\text{Pre FEV}_{1} - \text{Post FEV}_{1} \times 100 = \text{percentage (%) constriction} \over \text{Pre FEV}_{1}
\]

Equation 1.

**Statistical analysis**

Statistical analysis was performed using SPSS version 25.0 (Chicago, IL, USA); characteristic differences between success and failure groups were identified using independent \( t \) tests (\( p \) values documented).

Univariate regression analysis was performed for spirometry (FEV₁ and FEV₁ % predicted), age, gender, inhaled therapy and disease group as a precursor for multivariate regression models. FEV₁ % predicted was grouped into 5% increments from 40% to 60% to ascertain a risk point for conducting an inhaled therapy trial.

**Results**

During the two-year review period 204 patients performed an inhalation therapy trial at St. Bartholomew’s Hospital, with 106 as inpatients and 98 as outpatients (Table 1). The sample consisted of 114 females (55.9%). Mean age of 43.4 years (SD 19.4), FEV₁ of 1.65 ℓ (litres) (SD 0.86) and a FEV₁ % predicted 52.3% (SD 21.9). Inhaled therapy trials were completed for antibiotic therapy (\( n = 132, 64.7\% \)), then hypertonic saline (\( n = 64, 31.4\% \)) and rhDNase (\( n = 8, 3.9\% \)).

The failure rate was calculated as ten patients (4.9%) of the total inhaled therapy trials, with a statistically significant difference identified in age (42.6 years versus 57.8 years \( p = -0.027 \)), FEV₁ (1.68 ℓ versus 1.06 ℓ \( p = 0.026 \)) and FEV₁ % predicted (53.18% versus 35.5% \( p = 0.012 \)) between patients that passed compared to those that failed respectively. The regression analysis showed that those with an FEV₁ predicted <55% were statistically more likely to fail \( p = 0.005, R^2 = 0.039 \) (Table 2). There was no statistically significant difference found between gender, ethnicity, type of nebulised drug and outcome. Patients with CF