Title: Peak cough flow via tracheostomy – A useful assessment tool before decannulation?

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Body: Background: The decision to remove a tracheostomy tube (TT) balances the risk of premature decannulation and the benefit of minimising cannulation time. Objective criteria guiding this decision are lacking. A critical peak cough flow (PCF) of 160 L/min following TT removal is considered highly predictive of decannulation outcome. Aims: To ascertain the relationship of PCF measured via TT (PCF1) to PCF measured via oronasal mask following decannulation (PCF2), and determine a predictive model for PCF2>160 based on PCF1 and other potentially influential variables. Methods: A retrospective case note review was undertaken of tracheostomy care proformas completed in a hospital where PCF was measured pre- and post-decannulation. Twenty-three case notes were identified for inclusion. Results: PCF1 and PCF2 had a fair positive relationship (r_s=0.42, p<0.05). Only 13.6% of the variation in PCF2 could be explained by PCF1 variation. TT size and variables expected to influence upper airway dimensions, including age, height, gender, and risk factors for potential airway narrowing, also explained little of the variance in PCF2. PCF2 was significantly greater than PCF1 (median difference 53.4 L/min, p=0.002), although PCF2–PCF1 difference varied highly (range -146.4–243.0 L/min). PCF1 alone or in combination with other variables was not predictive of PCF2>160. For 8 patients with PCF2<160, 7 were ultimately successful decannulations. Conclusions: In the small heterogeneous study population, PCF1 was not a useful assessment tool to predict a PCF2>160 L/min. The significant PCF1-PCF2 relationship and diminished specificity of the PCF<160 threshold to predict outcome warrants further study.