Role of parafacial respiratory group and active expiration on the stabilization of sleep disordered breathing

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Background
It is currently hypothesized that the respiratory rhythm is generated by the interaction of two neural oscillators in the ventral medulla: preBötzinger complex (preBötz) which generates inspiratory activity and the parafacial respiratory group (pFRG) generating active expiration (Figure 1) through the contraction of abductor muscles, ADO (Flecken et al., 2013) (Figure 2).

Hypothesis
Given the association of obstructive AHI with sleep-related hypoventilation, we hypothesize that removal of active expiration (pFRG inhibition) and that its accompaniment stabilizes breathing and reduces AHI incidence.

Methods
Recent work in our laboratory in obstructive AHI positive periods of REM sleep across 13 adults has suggested that breathing was primarily contributing to the AHI events (Figure 2).

Activation and inhibition of pFRG
Sleep disordered breathing model

Future steps
Conduct data analysis on the sleep disordered breathing model. Perform experiments in which we activate pFRG in the presence of a compromised ADO.