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**Title:** Heart rate variability (HRV) and blood pressure (BP) changes in patients with neuromuscular disease (NMD) following setup of non-invasive ventilation (NIV)

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**Body:** Introduction: HRV and BP are indicators of autonomic nervous function, which can be affected by sleep disordered-breathing. We hypothesised that HRV and BP would describe the autonomic response to ventilatory support in NMD patients set up on NIV. Methods: NMD patients requiring domiciliary NIV were enrolled. Heart rate was measured overnight during self ventilation (SV), the first night of NIV initiation and following 3 months of NIV. Data were filtered and Fast-Fourier-Transformation was performed. Results: 6 NMD patients were recruited; 4 Duchenne muscular dystrophy, 1 motor neuron disease and 1 multi-system atrophy. We found a significant reduction of diastolic blood pressure, when comparing first night NIV with 3 months NIV (median 93 mmHg (77-103) vs 78 mmHg (73-88),  $p < 0.01$ ). Low frequency and high frequency domains increased (SV vs NIV), whilst there was a reduction in heart rate and sympathetic/parasympathetic ratio, as indicated by the low/high frequency ratio.

**Conclusion:** Using HRV and BP as markers for autonomic nervous function in NMD patients, NIV has been shown to have beneficial effects beyond the control of ventilation. Specifically, there was a reduction in sympathetic tone, heart rate and diastolic blood pressure. The measurement of HRV will allow assessment of the impact of NIV in reducing cardiovascular risk and long-term morbidity.