

# Patterns of Non-Invasive Home Ventilation Usage in the Province of Alberta, Canada: A Retrospective Population-Based Cohort Study

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**Rationale:** Non-invasive ventilation (NIV) is a viable treatment option for ventilator assisted individuals (VAIs) living at home with chronic respiratory failure (CRF). International data have suggested increased use of NIV; however, recent trends in NIV utilization for CRF across Canada are largely unknown.

**Methods:** We performed a retrospective population-based cohort study. All persons prescribed provincially funded home mechanical ventilation (HMV) with bi-level positive airway pressure (BPAP) devices for CRF between Jan 1, 2009 and Dec 31, 2014 were identified. This was accomplished by a manual review of all documented approvals by the Alberta Aids to Daily Living (AADL) Respiratory Benefits Program. To be eligible, AADL requires each patient to: 1) be assessed by a respirologist; and 2) have a documented diagnosis of one of sleep disordered breathing (SDB), a neuromuscular disorder (NMD) or restrictive thoracic disease (RTD). Our primary endpoint was incidence of NIV HMV use over time. Alberta Municipal census data was used. Secondary endpoints were to describe recent trends in case-mix and oxygen utilization.

**Results:** In total, 2,384 VAIs were identified during the 6 year study period. The average annual incidence of BPAP NIV use was 107.7 per million population (pmp) (estimated annual increase of 5.3% [95% CI, 1.5-9.1], p=0.02). Approximately 50% of VAIs resided in urban settings and 24% require supplemental oxygen. Overall, 6.4% were pediatric (6.7 pmp), with an estimated annual increase of 7.8% (95% CI, 2.2-13.5, p=0.02). SDB was the most common indication for NIV at 80% (86.7 pmp), increasing by 4.6% per year ([95% CI, 1.0-8.4], p=0.03), followed by NMDs at 13.6% (14.2 pmp; p=0.14 for trend).

**Conclusion:** NIV BPAP incidence for CRF has increased significantly in Alberta, in particular in children and patients with SDB. This may be in part due to greater acceptance of this therapy.