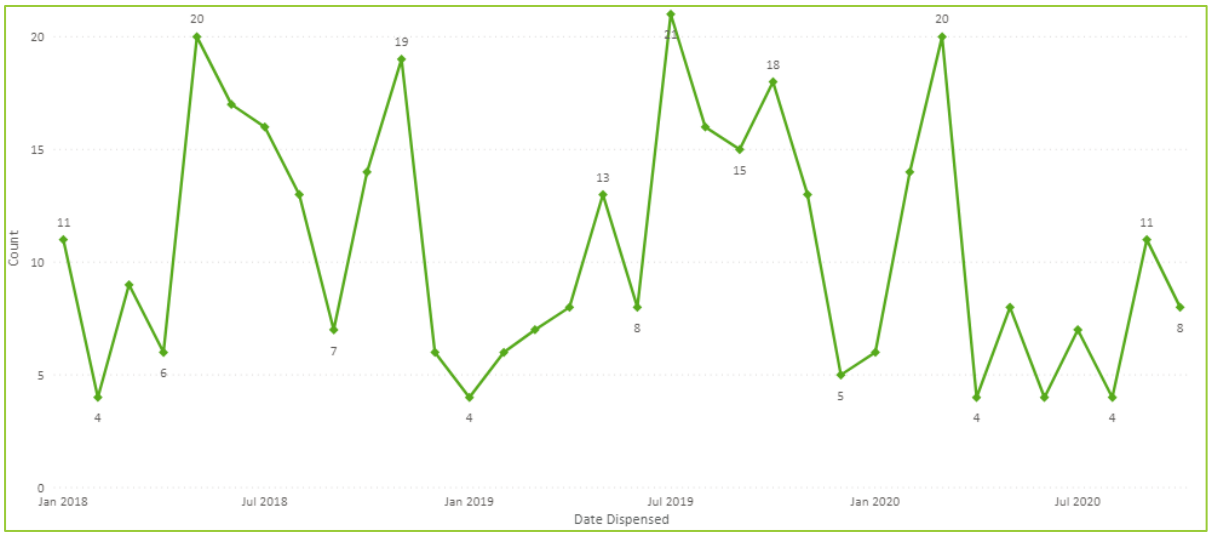
Salbutamol in infants under 1 year old

Practice Changing Moment

- Salbutamol is not recommended or indicated for use in children under 1 year.
- Salbutamol has not been found effective in children under 1 and is associated with adverse effects.

Figure 1: Hawke's Bay Prescriptions dispensed for Salbutamol in Children under 1 year old, 2018 to October 2020.



Background

Wheeze is defined clinically as a continuous, high-pitched sound due to intrathoracic airway obstruction that is audible on exhalation(1). Wheeze is often regarded as an indication of asthma, in children under five there are many other causes(1).

Bronchiolitis is common cause of wheeze in infants under 1 year of age(1). It is an acute viral infection of the lower respiratory tract, resulting in the small airways becoming inflamed and filled with debris (2). Respiratory syncytial virus (RSV) is the most common viral cause of bronchiolitis (70%)(3). Bronchiolitis is characterised by fever, cough, wheezing and increased respiratory effort. Other conditions that cause wheeze are rare in infants, a temperature >39^{0}C may indicate pneumonia, although wheeze is rare in children with pneumonia.

The management of bronchiolitis is supportive care(3), with hospitalisation for infants with severe bronchiolitis requiring higher levels of support(2). Bronchodilators are not indicated in the management of bronchiolitis or wheeze in children under 1 year(4).

In Hawke's Bay, salbutamol is being prescribed for under 1 year olds, without evidence to support its use.

Summary of Evidence:

- No significant improvement in symptoms after 4 weeks of salbutamol for 80 patients aged 3 months to 1 year, with a 6 weeks history of wheeze or night cough, and atopy(5).

- Systematic reviews and meta-analysis (13 to 30 trials) of the treatment of children under 1 with bronchiolitis, found no improvement in symptoms, reductions in hospitalisation, oxygen saturation or length of stay with salbutamol vs placebo(3,6–8)
- Australasian Bronchiolitis Guidelines found high-level evidence (NHMRC A, GRADE strong) demonstrating no benefit of beta-2 agonists in infants with bronchiolitis for the outcomes of admission to hospital, oxygen saturation or length of stay(4).
- Adverse responses to salbutamol from clinical trials include; hypoxaemia, increased airway resistance, declined in expiratory flow(5), tachycardia, mild hypertension, slight tremor and, temporary decrease in oxygen saturation(3)

Why is salbutamol not effective in children under 1 year?

Beta 2 agonists are primarily effective in reducing muscular constriction (bronchospasm) at the level of the bronchi(9). Acute viral infections cause bronchiolitis of the medium and small bronchioles, leading to mucosal oedema and inflammatory debris causing obstruction and not bronchoconstriction(5,9).

Further reading:

Starship guideline on the management of bronchiolitis 2019
https://www.starship.org.nz/guidelines/bronchiolitis/

Australasian Bronchiolitis Bedside Clinical Guideline (short version) 2016. Paediatric Research in Emergency Departments International Collaborative (PREDICT).

https://www.predict.org.au/download/Australasian-bronchiolitis-bedside-clinical-guideline.pdf

Useful patient resources

https://www.healthnavigator.org.nz/health-a-z/b/bronchiolitis/

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