

### Appendix 1: How to prepare and use oral viscous budesonide

In order to dispense the drug in a viscous solution, many different budesonide preparations have been used in local protocols for use in children and practice varies widely<sup>[21]</sup>. The pharmacokinetic profile of these carrier substances has not been published.

Trials have been completed into a proprietary budesonide oral solution but results have not yet been published and currently no licensed solution is currently available in UK<sup>[22]</sup>.

In the UK there are two strengths of budesonide nebule available that can be mixed into a viscous liquid or slurry; 500microgram in 2ml and 1mg in 2ml. The contents of one nebule is mixed with the adjunct immediately before a dose. Adjuncts commonly used in the UK are given below with currently used dosing.

A summary of international practice states that between 5-15ml of liquid of any sort e.g. apple sauce or honey or any other are used to mix with the budesonide nebuliser solution<sup>[21]</sup>.

Adjunct	Dose – Weight / volume	Dose – Standard household measure / scoops	Potential side effects and ingredients
Splenda Low Calorie Sweetener (also available as Splenda Stevia)	5g Splenda (sucralose) per 0.5mg (2ml) budesonide nebule	10 teaspoons (or 3.3 culinary tablespoons of 15ml) or 1 x Nutricia® 50 ml blue scoop.  Half the dose of Splenda can be used for a more viscous solution.	Sucralose or Stevia  May become contaminated with milk/soya during preparation  Potential long-term negative effects described on gut microbiome; cardiovascular risk; diabetes and cancer risk however evidence is limited <sup>[23-25]</sup>
Simple Syrup	10ml simple syrup per 0.5mg(2ml) budesonide nebule	2 teaspoons	Sucrose in water
Simple Linctus	10ml Simple Linctus per 0.5mg (2ml) budesonide nebule	2 teaspoons	Contains citric acid monohydrate, glycerol, aniseed flavour, maltitol liquid (contains sorbitol), sodium benzoate and purified water.
Budesonide dispersible tablet	N/A	N/A	Not licenced for under 18 years of age.  However evidence of effectiveness in adolescents <sup>[26]</sup>

Alternative adjuncts reported in international literature:

Apple sauce	5 g per 0.5mg (2ml) budesonide nebule	1 teaspoon	Allergic reactions to apple and other ingredients of the sauce <sup>[21]</sup>
Honey	5 g per 0.5mg (2ml) budesonide nebule	1 teaspoon	Not to be used in infants under 12 months of age due to botulism risk.  Theoretically could contain allergenic substances however allergic reactions to honey are rare <sup>[21]</sup>
Xanthan gum	50mg xanthan gum (0.05g) plus 5ml cooled boiled or sterile water per 2ml nebule budesonide	Needs to be measured	Not reported <sup>[21]</sup>