

## Compounding Oral Liquids

Pharmacists may need to extemporaneously prepare an oral liquid when commercial liquid products are unavailable, and tablets/capsules are unsuitable e.g. for patients with swallowing difficulties or those requiring doses that differ from available tablet strengths.

### Before compounding an oral liquid, consider whether:

- Tablets can be safely crushed or capsules opened and dispersed in liquid or mixed with soft food.
- An alternative route (e.g. buccal, sublingual, transdermal, rectal) is feasible.
- Patients could be taught how to swallow tablets:
  - [Difficulty swallowing medicines \(Healthify\)](#)
  - [Encouraging children to swallow tablets or capsules \(BPAC\)](#)

### If a small, part dose is needed, consider whether:

- Adjusting frequency is appropriate e.g. alternate-day dosing if the medicine has a long half-life.
- Rounding the dose to a half or quarter of a tablet is appropriate.

### Dispersing tablets or capsule contents

- Some formulations will disperse in water without crushing, while others need to be crushed first.
- Disperse in 10-20 mL of water and mix well in an oral dispenser.
- Give the mixture, or aliquot of the mixture, immediately.
- Prepare each dose freshly and discard the remainder.

### Compounding an oral liquid

Use New Zealand standardised formulae whenever possible. These are usually supported by stability data, and reduce the risk of errors due to pharmacies compounding different strengths.

- <https://www.psnz.org.nz/practicesupport/oralliquid>
- <https://www.pharmac.govt.nz/pharmaceutical-schedule/extemporaneously-compounded-products-and-galenicals/standard-formulae>

Modifying a standardised formula should generally be avoided to prevent stability issues.

- However, it is usually acceptable to substitute sugar-containing bases with sugar-free bases (e.g. Ora Blend® with Ora Blend SF®).
- It is not advisable to use a sugar-containing base if the stability study has been done with a sugar-free base as adding sugar may cause chemical instability.
- Use the same brand of pharmaceutical specified in the formula if possible.
- If considering compounding a liquid without stability data, this should be discussed with the prescriber, as there may be risks of inappropriate or inconsistent dosing if the product is unstable.
- To reduce the risk of microbial contamination, a 30-day expiry in the fridge is generally recommended for products containing a preservative, or a 7-day expiry for products without a preservative.

## Common ingredients in oral liquids

Product	Properties
Ora Blend®	Contains suspending agents, preservatives, and sugar (sucrose) Buffered to pH 4.3 Equivalent to a 1:1 mix of Ora Plus® and Ora Sweet® Bases available overseas such as SyrSpend SF pH4®, Oral Mix®, Oral Mix SF®, FlavorPlus®, and FlavorSweet® are similar to Ora Blend®
Ora Plus®	Contains suspending agents and preservatives Buffered to pH 4.0 to 4.5
Ora Sweet®	Does <b>NOT</b> contain a suspending agent Contains preservatives and sugar (sucrose) Buffered to pH 4.2
Ora Sweet SF®	Does <b>NOT</b> contain suspending agent or sugar (contains saccharin as sweetener) Contains preservatives Buffered to pH 4.0 to 4.4
Ora Blend SF®	Contains suspending agent and preservatives Does <b>NOT</b> contain sugar (contains saccharin as sweetener) Buffered to pH 4.2 Equivalent to 1:1 mix of Ora Plus® and Ora Sweet SF®
Preservatives	Used to prevent microbial contamination and made to a final concentration of 0.02-2%. Common preservatives are ascorbic acid, benzyl alcohol, metacresol, hydroxybenzoates (parabens), sodium metabisulfite. Pharmac standard formula: methyl hydroxybenzoate 10% solution. Use 1 mL of the 10% solution per 100 mL of oral liquid mixture. Pharmac link to <a href="#">Standard Formulae</a>
Suspending agents	Used when the medicine is poorly soluble to ensure a homogenous oral liquid Common suspending agents are methylcellulose, carboxymethylcellulose, xanthan gum, hypromellose.
Sweeteners	To sweeten oral liquids and mask taste of the pharmaceutical Common sweeteners are aspartame, glycerol, saccharin, sorbitol, sucrose (sugar), xylitol
Buffers	Maintain pH to ensure solubility and stability of the pharmaceutical Common buffers are citrate (to maintain acidic conditions), phosphate (to maintain neutral conditions), bicarbonate (to maintain alkaline conditions)

## Related Resources

Don't Rush to Crush	<a href="#">Free access for PSNZ members</a>
Nationwide Children's	<a href="#">Compounding Formulas</a>
PSNZ	<a href="#">General guidance for compounding oral liquids</a>
Sick Kids	<a href="#">Compounding Pharmacy Service</a>
Stabilis	<a href="#">Stability and compatibility of drugs</a>
Starship Hospital	<a href="#">Clinical Guidelines</a>
Te Whatu Ora	<a href="#">Guide for crushing oral medication for residents with swallowing difficulties in residential aged care</a>