

Position statement 18-01

Using Standardised Concentrations of Liquid Medicines in Children

Take home summary

NPPG and the Royal College of Paediatrics and Child Health (RCPCH) strongly recommend that when children require liquid medications, they should receive the RCPCH and NPPG recommended concentration, where one exists. There are currently 12 such recommended concentrations detailed below, 11 of which are published in relevant drug monographs of the BNF for Children.

By standardising the prescribed concentration of these medicines, we will reduce the risk of errors being made in the doses given to children and prevent hospitalisation from accidental under and overdoses.

Standard concentrations which should be prescribed

| Drug name | Concentration |
|------------------------------|---------------|
| Azathioprine | 50mg/5mL |
| Chloral Hydrate | 500mg/5mL |
| Clopidogrel | 25mg/5mL* |
| Ethambutol | 400mg/5mL |
| Hydrocortisone | 5mg/5mL |
| Isoniazid | 50mg/5mL |
| Phenobarbital (alcohol free) | 50mg/5mL |
| Pyrazinamide | 500mg/5mL |
| Sertraline | 50mg/5mL |
| Sodium chloride | 5mmol/mL** |
| Spironolactone | 50mg/5mL |
| Tacrolimus | 5mg/5mL |

* Clopidogrel concentration agreed, but as no monograph for this drug exists in the BNFC it is not included there.

** A licensed Sodium Chloride 1mmol/mL is available, though this is not considered suitable for general use due to the dose volumes patients would be required to receive.

Further Information

Every year there is harm to patients caused by accidental under and overdosing of medicines in children solely due to the fact that the concentration of their liquid medication changed and the person administering the medicine did not realise they needed to change the volume given.

A study by Rawlence *et al* was undertaken to establish through evidence and Delphi review of experts the most suitable concentration of each of the top 20 prescribed liquid special medications in children. When selecting initial concentration for review the following criteria were used:

1. Ideal : Dose for 1kg patient should not be less than 0.2mL and 50kg should not be more than 10mL
2. Satisfactory: Dose for 1kg patients should not be below 0.1mL and 50kg should not be above 20mL

Consensus on a standard concentration was found for 17 of the top 20 liquid special medications and these have been endorsed by the Medicines Committee at the RCPCH and published through the BNF for Children which both organisations publish with the Royal Pharmaceutical Society.

This position statement has been written to highlight that these standardised concentrations exist and to encourage all prescribers to prescribe these concentrations. We also encourage the use of these concentrations to be supported through their inclusion in local guidance. This will help prevent errors in children whilst enabling further work to look at excipient suitability and cost control.

The recommended concentrations can be found in the prescribing and dispensing section of the BNFC monographs for each of the drugs, whether accessed in paper or electronic form.

References

Rawlence E *et al*. Is the provision of paediatric oral liquid medicines safe? *Arch Dis Child Educ Pract Ed*. 2018;103(6):310-3. doi:

Disclaimer

This publication has been written by the NPPG Executive Committee and is intended for guidance purposes only, for consideration in conjunction with the reader's own professional knowledge and clinical judgement, the circumstances of the individual patient and all relevant pharmaceutical and healthcare literature and guidelines, or following and in conjunction with consultation with a qualified medical professional. While care has been taken to ensure the accuracy of the content, and it was produced following careful consideration of the evidence then reasonably available, NPPG does not accept any liability for any error or omission.

NPPG excludes, to the fullest extent permitted by law, all conditions, warranties and other terms which might otherwise be implied, any obligation of effectiveness or accuracy and any liability, arising in contract, tort or otherwise, for any direct, indirect or consequential loss or damage incurred in connection with this publication.

Nothing in this publication constitutes legal or medical advice and it cannot be relied upon as such.

The publication may not be reproduced or distributed, in whole or in part, without the prior written consent of the NPPG Executive Committee and should not be used by any person for personal, commercial, marketing or promotional purposes.

Written by: NPPG Executive Committee

Version: 8

Published: May 2022

Review date: December 2022

Key changes from Version 7 (published November 2021):

- Removal of the word "unlicensed" from title and Take Home Message.
- Change to description of where standardised concentration information can be found in the BNFC.

Email: position.statement@nppg.org.uk

Website: www.nppg.org.uk