

## BACKGROUND

Liquid flow rates, a.k.a. liquid consistency or thickness, has been shown to impact neonatal swallow physiology, patient safety, and the resulting neonatal outcomes.

The International Dysphagia Diet Standardization Initiative (IDDSI) has provided standardized terminology and definitions for foods and liquids to the benefit of dysphagia research and clinical practice. Clinical recommendations made by the developmental team in regards to safe PO intake in the neonatal population necessitates establishing a baseline of liquid flow rates for formulas, breastmilk, and fortification recipes used in our NICU.

## PURPOSE

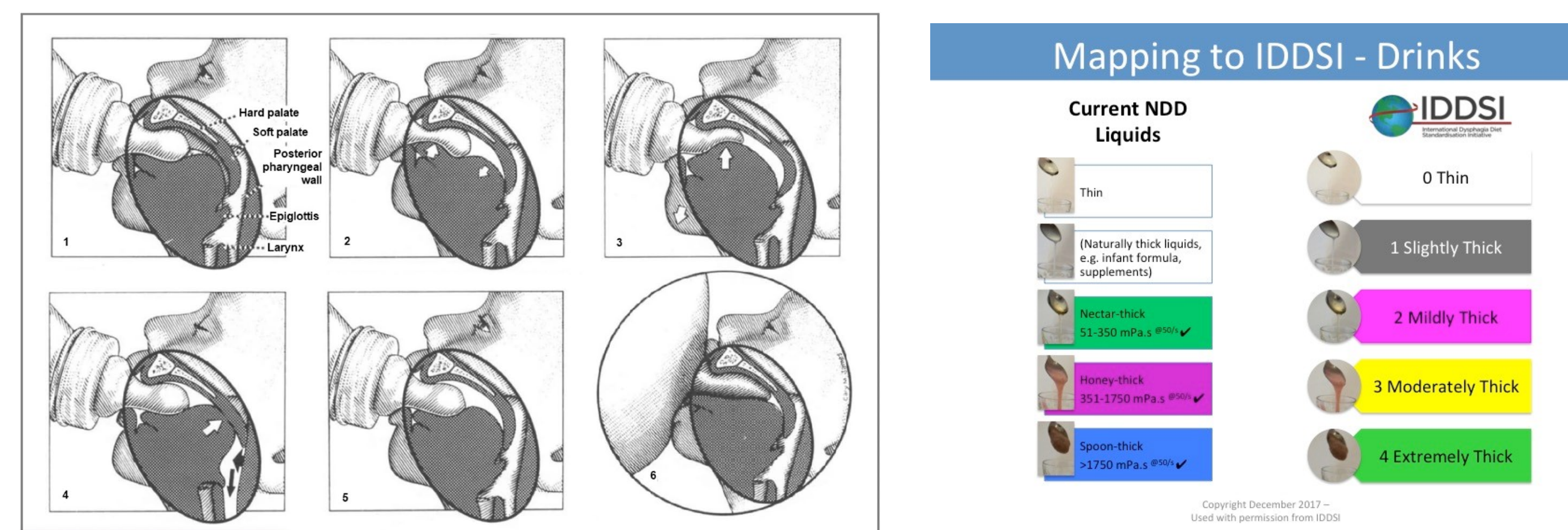
To provide developmental care for neonates in our NICU by establishing fluid flow rates and creating a record of reference for use in clinical practice.

## METHODS

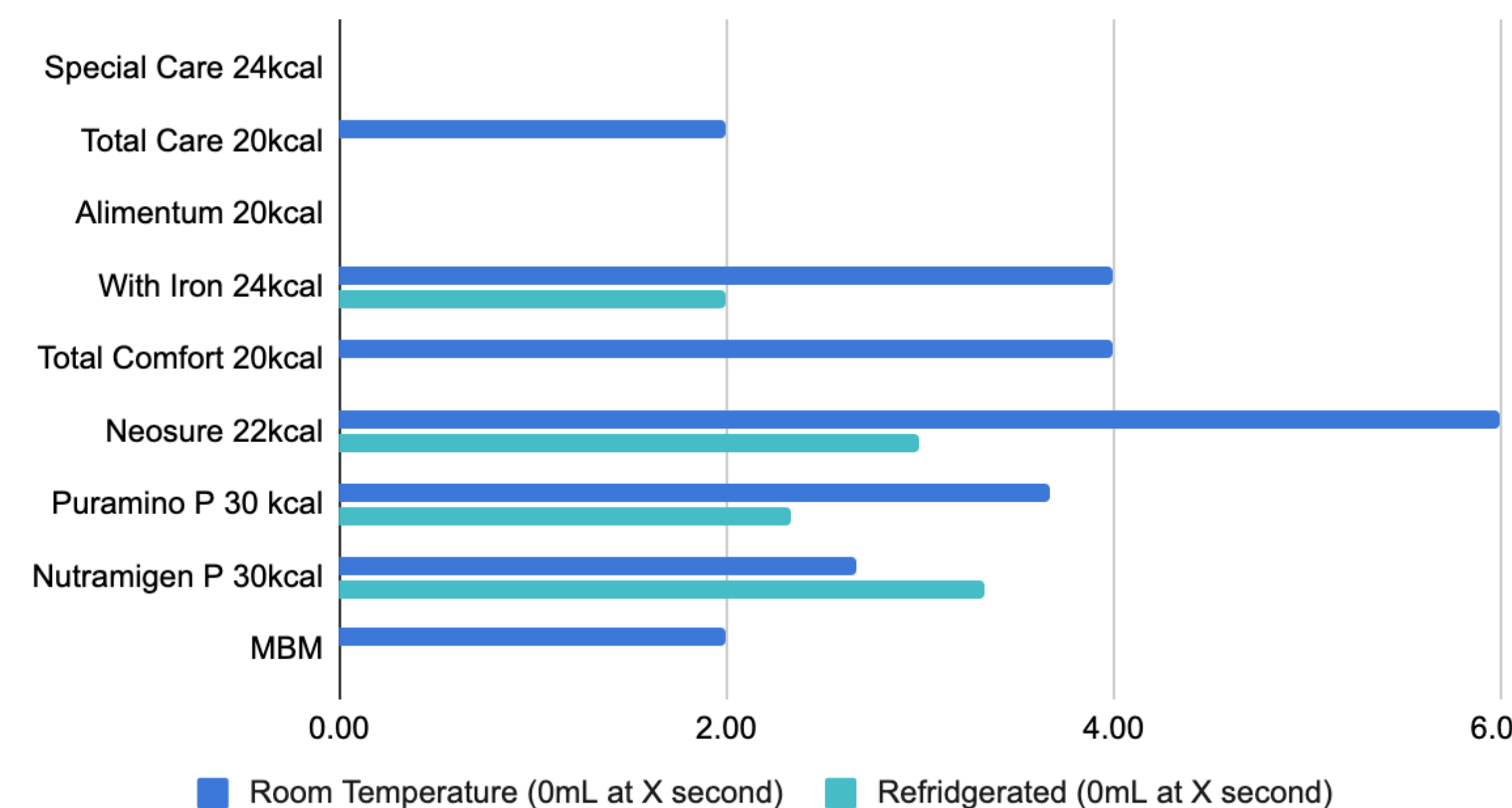
We conducted flow rate testing of formulas used in the NICU to establish a baseline for liquid thickness. These tests are in accord with the testing protocols of IDDSI. Then, we develop a record of that data to be used by the developmental team to inform clinical recommendations.

Formula tested: premixed & powder recipes used in the NICU, provided by RD/RN; x1 donated sample of breastmilk

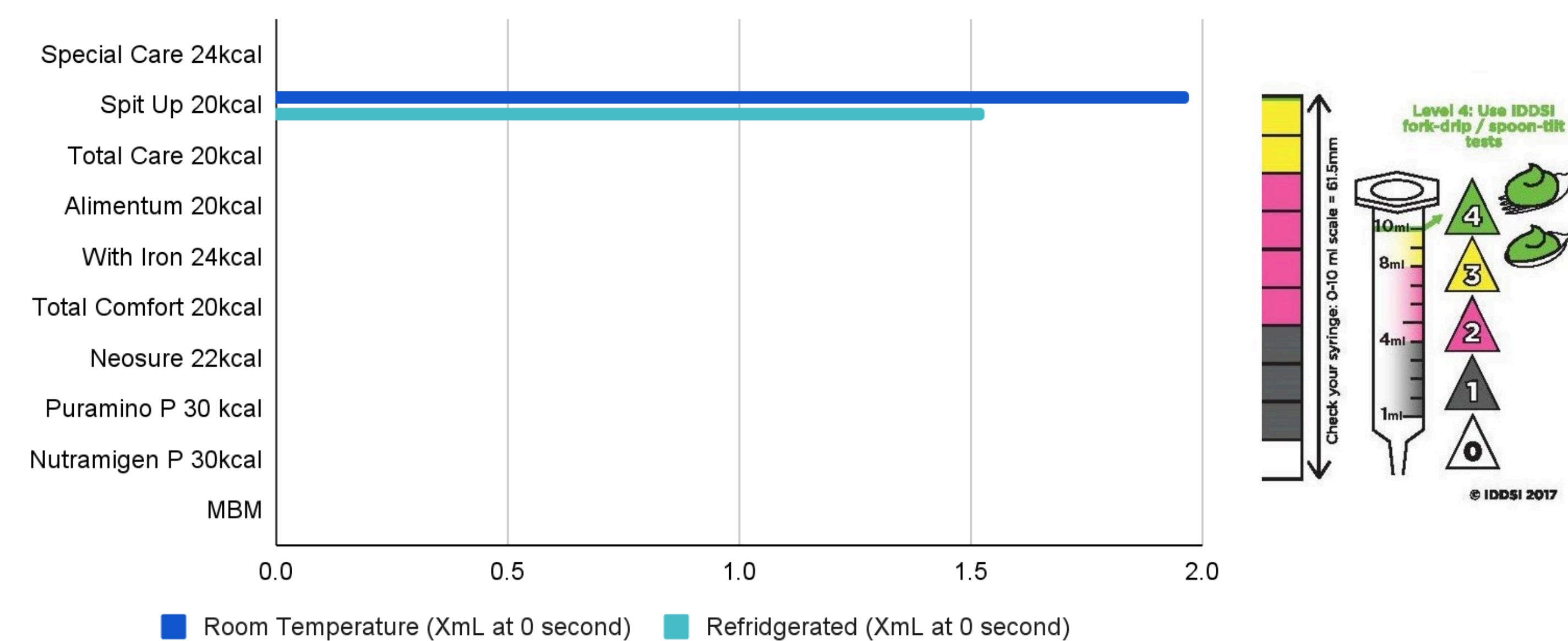
- 2 therapists conducting all tests to ensure accuracy
- BD 10mL Syringe with Luer-Lok Tip
- 10 seconds timer
- x3 trials for both room temperature and chilled conditions
- Creation of the clinical record for storing all data to be reference by the developmental team.



Formula Flow Rate



Formula Flow Rate



## RESULTS

Each fluid tested had a flow rate qualifying as a 'thin' liquid (level '0') according to the IDDSI classification protocol despite the expectation that most 'naturally' thick liquids would be expected to fall under the 'slightly thick' (level '1') category. The Similac Spit Up formula was noticeably slower, but still qualifies as a thin liquid. Of the powder recipes, flow rate consistency was impacted by clumping, improved mixing strategies and even straining is indicated. Ongoing testing is in progress given the large number of recipes utilized.

## CONCLUSIONS

This project enhances the developmental team's ability to anticipate the physiological impact of flow rate changes based on prescribed formulas and fortification recipes. It has resulted in updated recommendations for formula mixing methods to improve consistency of the resulting flow rate.

Improved clinical decision-making supports positive developmental outcomes in the neonatal population and supports a more robust collaboration with the medical team (i.e. nurses, physicians, pharmacists, and registered dietitians).

## REFERENCES

- [1] Prados and Feaster. (2020) Effect of Formula Type and Preparation on International Dysphagia Diet Standardization Initiative Thickness Level and Milk Flow Rates From Bottle Teats
- [2] Goldfield, et al (2013). Preterm infant swallowing of thin and nectar-thick liquids- Changes in lingual-palatal coordination and relation to bolus transit.
- [3] Cichero, et al. (2013) The Need for International Terminology and Definitions for Texture-Modified Foods and Thickened Liquids Used in Dysphagia Management- Foundations of a Global Initiative
- [4] Steele, et al. (2015) The Influence of Food Texture and Liquid Consistency Modification on Swallowing Physiology and Function- A Systematic Review

