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SUBJECT/TITLE POLYETHYLENE GLYCOL 3350 LAXATIVE and THICKENING AGENTS	ORIGINAL DATE 15-NOV-2019
	REVISION EFFECTIVE DATE

Calgary Zone Long Term Care Pharmacy and Therapeutics Committee Position Statement regarding Polyethylene Glycol 3350 laxative (PEG 3350) and thickening agents

Issue: In October, a memo was circulated by AHS Nutrition Services regarding the use of thickened fluids as part of dysphagia management for patients who concurrently require or receive a PEG 3350 laxative (AHS Nutrition, Food, Linen & Environmental Services, 2019 Oct 16). The information in the memo is generating discussion and questions in long term care about what products can be mixed and how to best manage this scenario.

Background: In August 2019, ISMP Canada released a Safety Bulletin about a potentially harmful interaction between PEG laxatives and starch-based thickeners. The interaction of a liquid thickened with a starch-based thickener and PEG laxative results in a mixture than becomes thin and watery. The mixed product is no longer suitable for administration to a dysphagia patient requiring thickened fluids. One of the recommendations by ISMP is for PEG laxatives, if required for a patient with dysphagia on thickened fluids, to be mixed with liquids thickened with xanthan gum-based thickeners instead. The ISMP Bulletin does not identify any particular brand of thickeners or PEG laxatives (ISMP Canada, 2019).

In our practice environments, a variety of brands of starch-based thickeners, xanthan-gum based thickeners and PEG 3350 laxatives are used. The inevitable question arises, “Can brand X be mixed with brand Y?” If a manufacturer is asked this question, they may be limited as to how they can respond based on what they have studied. They may be unable to recommend additional administration instructions for their products outside of approved Health Canada labelling information or official drug monograph information.

Information to support clinical practice also comes from other sources of clinical data. For example, the ISMP Bulletin referenced above, published literature, and clinical experience. All these information pieces, in addition to the principles of informed shared decision making, should assist in forming a conclusion for your practice setting.

Information to support the use of a xanthan gum-based thickener and PEG 3350 is limited and like all case report data, requires further published validation. This information available is based on a published case report by Carlisle BJ *et al.* The case report describes the interaction between starch-based thickened fluids and PEG 3350 laxative and further goes on to quantify the

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interaction and lack of interaction with xanthan-gum thickened fluids using rheology (mixing) data. The data from this testing suggested that xanthan-gum thickened fluids mixed with PEG 3350 laxative remained stable. The report specified the xanthan-gum thickener as Simply Thick®, but it did not identify the PEG 3350 product (Carlisle BJ, 2016).

ISFL Pharmacy representatives undertook some product testing to observe and qualify the interactions between PEG 3330 and starch-based thickened fluids and xanthan-gum based thickened fluids. The following observations were made:

1. PEG 3350 (Lax-A-Day®, Jamp-Emolax®, RestoraLAX®) prepared in water following manufacturer directions **did not** thicken when starch-based thickening agent (ThickenUp®) was added according to nectar, honey and pudding thick consistencies.
 - a. The consistencies of the experimental samples of PEG 3350 in water with starch-based thickener **did not** match the consistency of the control samples of water mixed with starch-based thickener for each consistency tested. The control samples thickened as expected.
 - b. The order of mixing did not impact the results; both methods failed to result in a final thickened product.
2. PEG 3350 (Lax-A-Day®, Jamp-Emolax®, RestoraLAX®) when mixed into starch-based pre-thickened fluids (Sysco® Thickened Lemon Flavoured Water - Mildly Thick, Sysco® Thickened Apple Juice - Moderate Thick) caused the pre-thickened drinks **to thin out to water-like consistency**.
3. PEG 3350 (Lax-A-Day®, Jamp-Emolax®, RestoraLAX®) prepared in water following manufacturer directions **did** thicken correctly when xanthan gum-based thickener (ThickenUp Clear®) was added according to nectar, honey and pudding consistencies.
 - a. The consistencies of the experimental samples of PEG 3350 in water with xanthan gum-based thickener matched the consistency of the control samples of water mixed with xanthan gum-based thickener for each consistency tested.
 - b. The consistencies of the experimental and control samples were maintained beyond 5 minutes and up to 20 minutes. Testing concluded at 20 minutes.
 - c. Based on this testing, the order of preparation (i.e. preparation of PEG in water, then xanthan gum-based thickening agent added vs. preparation of xanthan gum-based thickened water, then PEG 3350 added) did not appear to affect the final

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results; both methods resulted in appropriately thick final product. However, mixing PEG into the water first required less stirring time to incorporate into solution. Adding PEG to xanthan-gum based thickened water required at least 3 minutes of vigorous stirring to eventually incorporate. Thus, the preparation of PEG 3350 solution first is recommended.

Notes:

- The fluid used to prepare PEG 3350 was limited to tap water for this testing; other fluids, such as coffee, tea, and juice were not tested.

IN SUMMARY:

For Clients in Calgary Zone LTC facilities, Calgary Zone LTC P&T representatives recommend the following:

- 1) Identify clients who are on concurrent thickened fluids and PEG 3350 laxative
- 2) The care team should understand the possible interactions with thickeners and explore alternate therapeutic options with the patient.
- 3) If continuing with PEG 3350 laxative, it **should not** be administered in a starch-based thickener. This is documented, published interaction (Carlisle BJ, 2016) (ISMP Canada, 2019).
- 4) There is limited literature to support the use of xanthan gum-based thickened fluids and PEG 3350 laxative, thus caution is advised. Careful preparation and inspection of the mixed product at the point of administration is advised.
 - a. PEG 3350 solution is prepared first according to manufacturer directions in the desired fluid until dissolved.
 - b. The correct amount (as per manufacturer instructions for the desired consistency) of xanthan-gum based thickening agent is stirred into the PEG 3350 prepared fluid. Thickening occurs between 1 to 5 minutes; it is not immediate.
 - c. Staff should ensure the prescribed thickness is maintained up to the point of administration.
 - d. Monitor for effectiveness and therapeutic outcome. Bioavailability of any medication in thickened fluids is not included in this discussion. This topic also lacks published evidence and manufacturer data.

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- e. Monitor for adverse effects, including adverse effects from the administration technique.
- 5) The pharmacy provider should affix an auxiliary label to the PEG 3350 product container with the suggested following wording, "Do not mix with starch-based thickeners. Caution with other thickening agents"

References

- AHS Nutrition, Food, Linen & Environmental Services. (2019 Oct 16). Patient Safety Concern: PEG laxative interaction with starch-based thickener causes thinning of thick fluids. Memorandum.
- Carlisle BJ, C. G. (2016). PEG and thickeners: a critical interaction between polyethylene glycol laxative and starch-based thickeners. *Journal of the American Medical Directors Association*, 17(9), 860-861.
- ISMP Canada. (2019, August 28). Potentially Harmful Interaction between Polyethylene Glycol Laxative and Starch-Based Thickeners. *ISMP Canada Safety Bulletin*, 19(7).