SAFETY BULLETIN

Ontario
Cancer Care Ontario

Produced by: Systemic Treatment Program

Systemic Treatment Administration

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Residual volume of drug remaining in IV tubing post administration

Target Audience: Healthcare professionals (nurses, pharmacists and pharmacy technicians) involved in the preparation, delivery and administration of systemic treatment, leaders of systemic treatment infusion centres, professional practice leaders

Key Issue: Variation in processes when administering low volume, high concentration systemic therapy may lead to variation in intended dose being delivered to the patient.

Background Information

Cancer Care Ontario has identified a variation in practice relating to systemic therapy administration resulting in a variation in intended dose delivery. This issue pertains to small volume, high concentration medications that are delivered as monotherapy i.e. pembrolizumab, nivolumab and panitumumab, where more than the expected amount of the drug remains in the IV tubing due to practices related to intravenous (IV) line flushing.

It is understood that in some instances hospital practices or policies were introduced to protect healthcare providers involved in the delivery of systemic treatment by decreasing the number of manipulations to the IV line in order to maintain a closed system. Other potential contributing factors to this issue include: the use of a primary line where flushing is not possible, the use of new or different pumps and equipment that resulted in more than expected residual drug volumes in the administration set tubings, and a lack of standardized procedures on flushing and administration sets to maximize drug delivery to the patient. The evidence base to inform best practices is not robust; however, some of the other cancer agencies have adopted the use of secondary lines (e.g. BCCA, NS).

A small variation in dosing (approximately 10%) has not been shown to affect patient health outcomes adversely.[1-5] This is based on variances within dose calculations, pharmacokinetic principles, clinical evidence, and both inter- and intra-patient variability in drug clearance. Therefore, depending on the volume of drug that remains in the IV tubing, the percentage of the total dose could fall within this accepted variation.

Healthcare Professionals are advised to:

- Review hospital policies and procedures for all low volume, high concentration monotherapy drugs to ensure that the volume of drug that is reaching the patient, and ultimately the dose, is optimized.
  - Where improvement opportunities are identified, changes in practice should be undertaken based on best available evidence or standard of care).
- Any discrepancies in dosing above the accepted variation should be reported to Cancer Care Ontario and we also encourage reporting to ISMP Canada.
- Please email the Drug Formulary team at drugformulary@cancercare.on.ca if any further support or information is required.

We will be working with our partners to ensure that all learning is shared.

References: 1. Jenkins P, Wallis R. Dose-rounding of adjuvant chemotherapy for breast cancer: an audit of toxicity. J Oncol Pharm Practice 2010;16:251-5.
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3. Bott AM, Fahrenbruch R, Gilmore S, Kintzel P, Markham R. Dose rounding of biologic and cytotoxic anticancer agents—a position statement of the hematology/oncology pharmacy association. Chicago IL. Retrieved from http://www.hoparx.org/images/hopa/resource-library/professional-tools/Dose-Rounding-Position-Paper-2017-10-23.pdf.
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