Bolusing IV Administration Sets With Monoclonal Antibodies Reduces Cost and Chair Time: A Randomized Controlled Trial

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BACKGROUND: Monoclonal antibodies are widely used anticancer therapies. Increasing demand for ambulatory care necessitates exploration of efficiency measures.

OBJECTIVES: The primary objective was to evaluate the impacts on chair time and associated cost of priming IV administration sets with a bolus of the prescribed monoclonal antibody drugs. A secondary objective was to assess the associated incidence of hypersensitivity reactions.

METHODS: A large tertiary hospital in Brisbane, Australia, conducted a randomized controlled trial (N = 128) with a two-arm design. Included monoclonal antibodies were daratumumab, obinutuzumab, pembrolizumab, and nivolumab.

FINDINGS: There was a statistically significant reduction in chair time for obinutuzumab, pembrolizumab, and nivolumab compared with the control. Findings suggest that this priming intervention reduces chair time and cost for some monoclonal antibody drugs. Future research could assess this practice in other oncology therapies.

KEYWORDS
IV administration; monoclonal antibodies; priming; chair time; cost saving

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MONOCLONAL ANTIBODY DRUGS HAVE REVOLUTIONIZED cancer treatment and are considered a key component of cancer therapy alongside surgery, chemotherapy, and radiation (Zahavi & Weiner, 2020). They work by directly targeting tumor cells while simultaneously promoting an antitumor immune response (Bayer, 2019; Zahavi & Weiner, 2020). Monoclonal antibody therapy is delivered continuously via a vascular access device and an IV administration set. This set includes a drip chamber and connects the patient to the infusion bag via plastic tubing. Standard practice is to prime the IV administration set (which has a volume of about 16 ml) with normal saline or a compatible fluid to prevent the introduction of air before connecting the line to the patient (eviQ, 2023). Once primed, the infusion bag containing the prescribed drug is connected to the administration set, and the line is connected to the patient. The prescribed drug is then infused via an electronic pump at a prescribed infusion rate, commencing at a slow rate and tapering up to the prescribed rate over time. Through this practice, the 16 ml of compatible fluid that is present in the administration set at the commencement of the infusion is administered at the prescribed rate, potentially causing a delay in the prescribed drug reaching the patient. This results in unnecessary additional time in the treatment chair, affecting patient flow as well as patient and staff experience (Liang, 2015).

Ambulatory oncology settings require a range of resources, including clinicians, administration staff, treatment chairs, and medical equipment. These settings regularly experience a range of uncertainties, such as unforeseen treatment delays, cancellations, add-ons, and delays in laboratory and pharmacy services (Liang, 2015). Compounding these issues are the ongoing effects of the COVID-19 pandemic on staffing and clinical demand, highlighting the importance of maintaining efficiency in care delivery (Davis et al., 2022).

Literature suggests that priming the line of IV administration sets with a bolus of 16 ml of the prescribed monoclonal antibody drug prior to infusion is a safe and efficient practice (Laudati et al., 2018). A retrospective study linked this practice with a decreased incidence of hypersensitivity reactions in monoclonal antibodies, such as rituximab (Laudati et al., 2018). Researchers found that priming the line with rituximab allowed for a slow,