Abstract

Impact of an End-to-End Procedure on Extravasation Events During Intravenous Chemotherapy

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Introduction. The cancer burden is increasing, and intravenous chemotherapy remains a cornerstone of cancer treatment. Extravasation or infiltration of antineoplastic drugs is a potentially preventable adverse event associated with pain, tissue injury, treatment delays, and reduced quality of life. Nevertheless, gaps persist in the traceability of the drug pathway and in the standardisation of safety checks from preparation to administration. This study assessed the impact of implementing an end-to-end monitoring procedure on the number and severity of recorded events, highlighting the contribution of nursing surveillance at critical stages of the process.

Methods. This retrospective pre–post study analysed consecutive records of extravasation or infiltration events collected between 2022 and 2025 at an Italian cancer centre. Two periods were compared: 2022–2023, before implementation of the procedure, and 2024–2025, following the introduction of end-to-end monitoring from drug preparation to administration. Outcomes included the number of events recorded in each period, the estimated extravasated volume, and the documentation of nursing safety procedures, patient education, and vein integrity assessment.

Results. Fifteen events were analysed. The number of recorded events decreased from nine in 2022–2023 to six in 2024–2025, corresponding to a 33% reduction. During the pre-implementation period, the estimated extravasated volume ranged from 0.5 to 25 mL, and two of the nine events exceeded 5 mL. In the post-implementation period, volume data were available for four of the six events; the recorded volume ranged from 4 to 5 mL, with no events exceeding 5 mL. Patient education was documented in 88.9% of cases before implementation and in 100% after implementation. Vein integrity assessment was documented in all cases during both periods.

Discussion. Following implementation of the end-to-end procedure, fewer extravasation or infiltration events were recorded, and their severity appeared to decrease, suggesting earlier detection and more timely management. These findings emphasise the central role of nurses in monitoring the process and ensuring patient safety. However, the absence of data on the total number of intravenous infusions prevented the estimation of incidence rates and limited causal inference. Future prospective studies should report events per 1,000 infusions and adopt standardised monitoring indicators.

Keywords: Oncology Nursing, Patient Safety, Extravasation, Traceability, Monitoring, Intravenous Chemotherapy

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