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GUEST EDITORIAL

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A VISUAL MANAGEMENT TOOL FOR NURSES TO STANDARDIZE THE ADMINISTRATION OF VESICANT CHEMOTHERAPY

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The treatment of cancer is a complex process that requires multiple modalities (i.e. surgery, radiotherapy, immunotherapy and/or chemotherapy). Despite its anticipated benefits, chemotherapy has side effects and complications such as extravasation, which is considered as one of the most severe and acute complications of peripherally infused intravenous chemotherapies.¹ Extravasation occurs when a vesicant chemotherapeutic agent that has a potential to cause blistering² leaks outside the vein into the surrounding tissues.³ This leakage could lead to treatment delays, termination of chemotherapy, tissue necrosis, a loss of

limb, deep tissue infections, and maybe death.³

The incidence of extravasation in adults was estimated to range from 0.1% to 6%.⁴ These low rates are probably due to the under-reporting or lack of registries of such unfortunate incidents.⁵ Ensuring the safety of patients and sustaining their optimal quality of life are the core values for any health care system, so battling extravasation should be a priority and a goal. The occurrence of extravasation often leads to skin breakdowns that require wound care consultation and treatments by a specialist.⁶ Impairment in skin integrity poses a risk for skin infections, especially among the cancer population that

complains of compromised immunity.⁶ The treatment of skin breakdowns induced by extravasations involves antimicrobial agents and special wound dressings which extend the patients' length of stay and elevates the health bills.⁶ For instance, the cost range of dressings was reported to be between \$10-30 per dressing, and the time to heal a minor to moderate skin breakdown might take up to 14 hospital days depending on the nature of infiltrated drug.⁶ It is estimated that the cost of extra hospitalization required to manage a catheter induced extravasation and skin lacerations can reach up to \$5,950 in medical/surgical wards and up to \$11,200 in critical wards per incident.⁶ In much worse scenarios, surgical skin grafts might be needed.⁶ In summary, the expensive cost of extravasation management will affect the hospital financial revenues. Moreover, the patients and their families won't be satisfied contracting such unfortunate incidents.

In the recent decades, the cost of treatment has become an important issue in the healthcare sector. Many hospitals became interested in embracing the quality concepts especially after the success story of Toyota's Production System (LEAN production) in the 1960s⁷ which paved a global pathway towards quality. LEAN can be defined as a collection of principles, practices and methods that aim to design, improve and manage processes,⁸ by using strategies such as stream mapping, time measurement, visual management tools and the 5S system (sort, set in order, shine, standardize, sustain).⁹

LEAN principles can also be applied to various sectors including the healthcare systems. Nowadays, a growing number of hospitals are utilizing LEAN principles⁹ to increase the efficiency of services and quality of care.⁸ In the healthcare industry, LEAN means centralizing the care process around the patients' needs and enabling

staff to add value through the delivery of effective, high-quality and safer care.⁹ Fortunately, nurses are qualified and skilled enough to utilize quality principles because they are already following systematic steps to reach the best outcomes in their daily practice which complements the LEAN process.¹⁰

The peripheral infusion of a vesicant chemotherapy is a complex and high-risk procedure that includes an interdisciplinary process starting from ordering until administration. Any error or negligence in such a process might lead to harm including, but not limited to extravasation. Nurses can be accounted as key players against extravasation.² Nurses can actually utilize some LEAN management strategies to positively influence the administration of vesicant chemotherapeutic infusions. The optimal management of extravasation starts by its prevention,¹ which might not be fully guaranteed² especially if there isn't a standardized process map. Any variations in the administration of chemotherapeutic infusions might increase the risk of extravasations.

In general, nurses shall avoid inserting angiocatheters into deep fragile veins or into veins that have been punctured multiple times. Adhering to the distal vein first then the proximal in the selected area is encouraged.¹¹ A small-gauge catheter to minimize trauma to the vein is preferable.¹¹ Nurses are not advised to administer a vesicant chemotherapy through a peripheral intravenous access inserted since more than 24 hours.¹¹ Careful attention should be paid to cancer patients who have impaired communication, compromised circulation, altered sensory perception or poor understanding of the potential risks of peripheral infusion of chemotherapy. Older patients are also at higher risk to develop catheter complications too. Therefore, nurses are advised to inform

and educate cancer patients on the aim behind initiating the peripheral infusion of chemotherapies as well as the early signs of catheter complications including extravasations.³ The catheter shall be secured properly to prevent the mobilization of the catheter tip outside the vein, and the insertion site should be covered with a transparent dressing to observe for early signs of complications

(redness, warmth, leaking).¹¹ Prior the infusion of intravenous fluids, testing for a blood backflow is a very important protective technique,^{2,11} yet a blood return alone does not prevent extravasation throughout the administration process. Therefore, routine checking at the insertion site should be conducted to assess for new occurring pain, swelling, or erythema.³

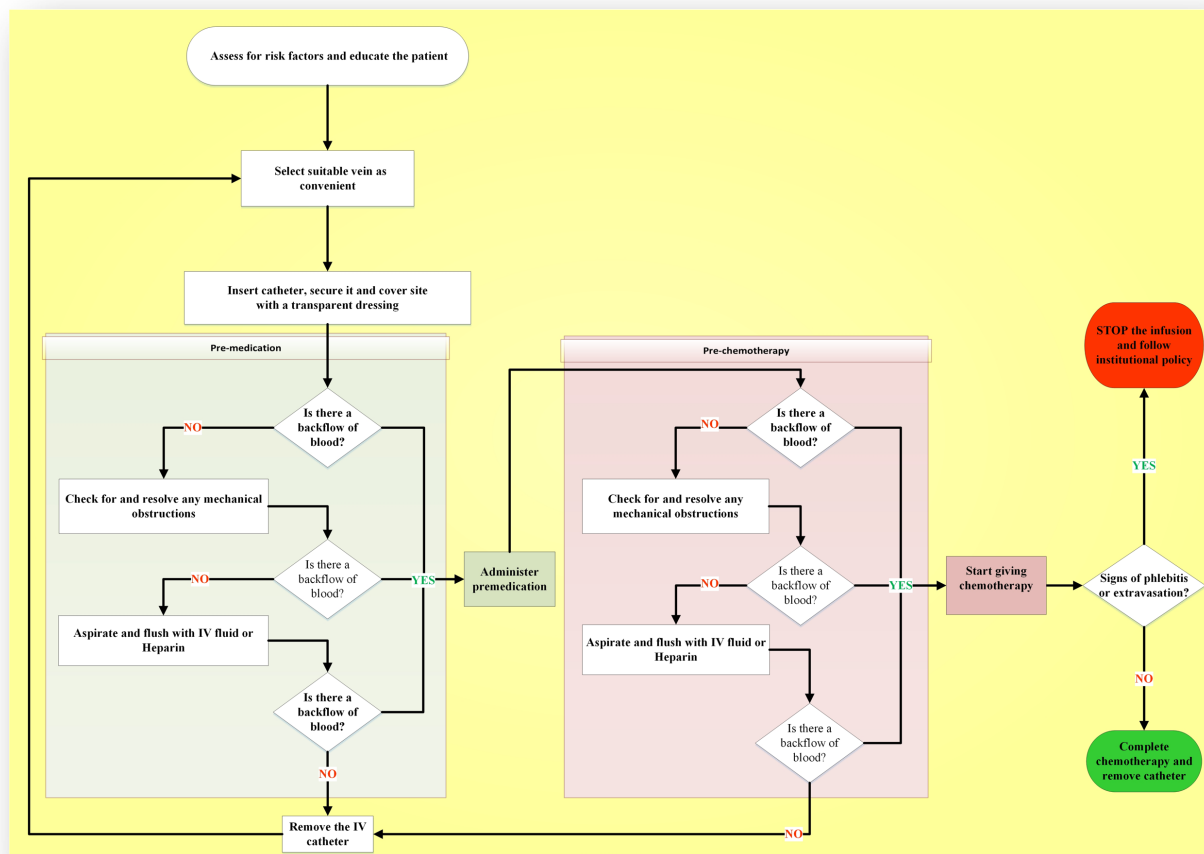


Figure 1 Visual management tool to standardize the administration of vesicant chemotherapy

International guidelines which focus on chemotherapy and prevention of its complications are available to provide a better management of extravasation.³ Moreover, some recommendations from published literatures have standardized the process of administering chemotherapy,^{5,11}

but it mainly focuses on the extravasation management rather than prevention. Although the process of administering chemotherapy might be grasped and well perceived by nurses during their orientation, training and regular competency check-ups, it is important to

make the process of administering vesicant chemotherapy available in a visual format, [Figure 1]. Using visual management tool creates a “self-ordering, self-explaining, self-regulating and self-improving workplace environment where what is supposed to happen does happen, on time, every time”.¹² We suggest using this tool to unify the process of administering vesicant chemotherapies in clear well-defined visual steps. It will help nurses minimize the variations in practice. In case an incident of extravasation occurs, it shall provide a better understanding of what, how, and at which step the process went wrong.

Declaration of Conflicting Interest

None declared.

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Authorship Contribution

Authors have equal contribution in this study.

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