

Background

Patients receiving taxanes are at a high risk for developing hypersensitivity reactions (HSRs) primarily during first and second lifetime exposures (Lynch et al., 2023). Taxanes include two commonly prescribed chemotherapies: paclitaxel and docetaxel. It is common practice to titrate the first two infusions of these chemotherapies slowly to help decrease risk of reaction and to lessen the severity of an HSR. There is currently no professional guideline from the Oncology Nursing Society (ONS) or the National Comprehensive Cancer Network (NCCN) for the titration of taxanes. Similarly, Salinas Valley Health Medical Center's Outpatient Infusion Center (OIC) also had no established standard for titration. While orienting new nurses to the OIC, it was identified that first and second taxane infusions were titrated differently by nurses, leading to confusion for newly hired nurses and introducing the potential for errors. Thus, the need to create a standardized titration protocol was identified.

Purpose Statement

The purpose of this quality improvement initiative was to evaluate best practice recommendations for the titration of taxane chemotherapies and to standardize the administration process used by OIC nurses.

Methods

A nine-item electronic survey was distributed over 3 days in October 2024 to determine baseline practices. Eight of ten eligible nurses completed the survey. Responses revealed that at least six different strategies were being used for taxane titrations. Nurses reported inconsistency with first taxane infusions, with three of eight nurses indicating they do not use the same titration process with each first taxane infusion. Seven of eight nurses reported that a consistent titration process would be beneficial (see Table 1).

Table 1

Baseline Titration Process Survey		
Question	Do you use the same titration process with each first time taxane?	Do you think a consistent titration process would be beneficial?
Total Responses	8	8
Yes	5 (62.5%)	7 (87.5%)
No	3 (37.5%)	1 (12.5%)



A literature review was done to evaluate best practices for taxane titration. Three articles, which used the number of HSRs as the outcome measure, were selected based on relevance and publication date (Lynch et al., 2023; Mendez et al., 2021; Sefah et al., 2023). These articles were distributed to all OIC nurses for review and were brought to the monthly Outpatient Infusion Journal Club meeting in October 2024.

The three articles used different titration strategies and compared HSR rates between titration and non-titration groups through retrospective analysis. Two articles assessed titration of paclitaxel only, one article evaluated the titration of both paclitaxel and docetaxel. All three articles saw similar results with HSRs occurring in 4.4% (Mendez et al., 2021), 4.8% (Sefah et al., 2023), and 7% (Lynch et al., 2023) of patients in the titration group, compared to the standard infusion. After discussing the articles, nurses present at the journal club meeting agreed on a modified version of a titration strategy utilizing a three-step approach from Lynch et al. (2023). The strategy was modified to meet the requirements of slow titration, while considering time constraints and treatment length. No changes were made to the pre-medication process as the OIC was already following the NCCN standards for pre-medication. The modified strategy for administration involved priming the tubing, starting the infusing at ¼ of the recommend rate for 10 minutes, increasing the infusion to ½ the recommended rate for 10 minutes, then infusing the remainder of the medication at the recommended rate. Per the journal club discussion, the practice change was implemented immediately, on October 15, 2024. All nurses were educated on the practice change via email and morning huddles, and a printed version of the protocol was placed on all mobile workstations for easy reference. A follow up survey was conducted during 3 days in February 2025, approximately 4 months after the practice change to evaluate nurses' use of the new protocol.

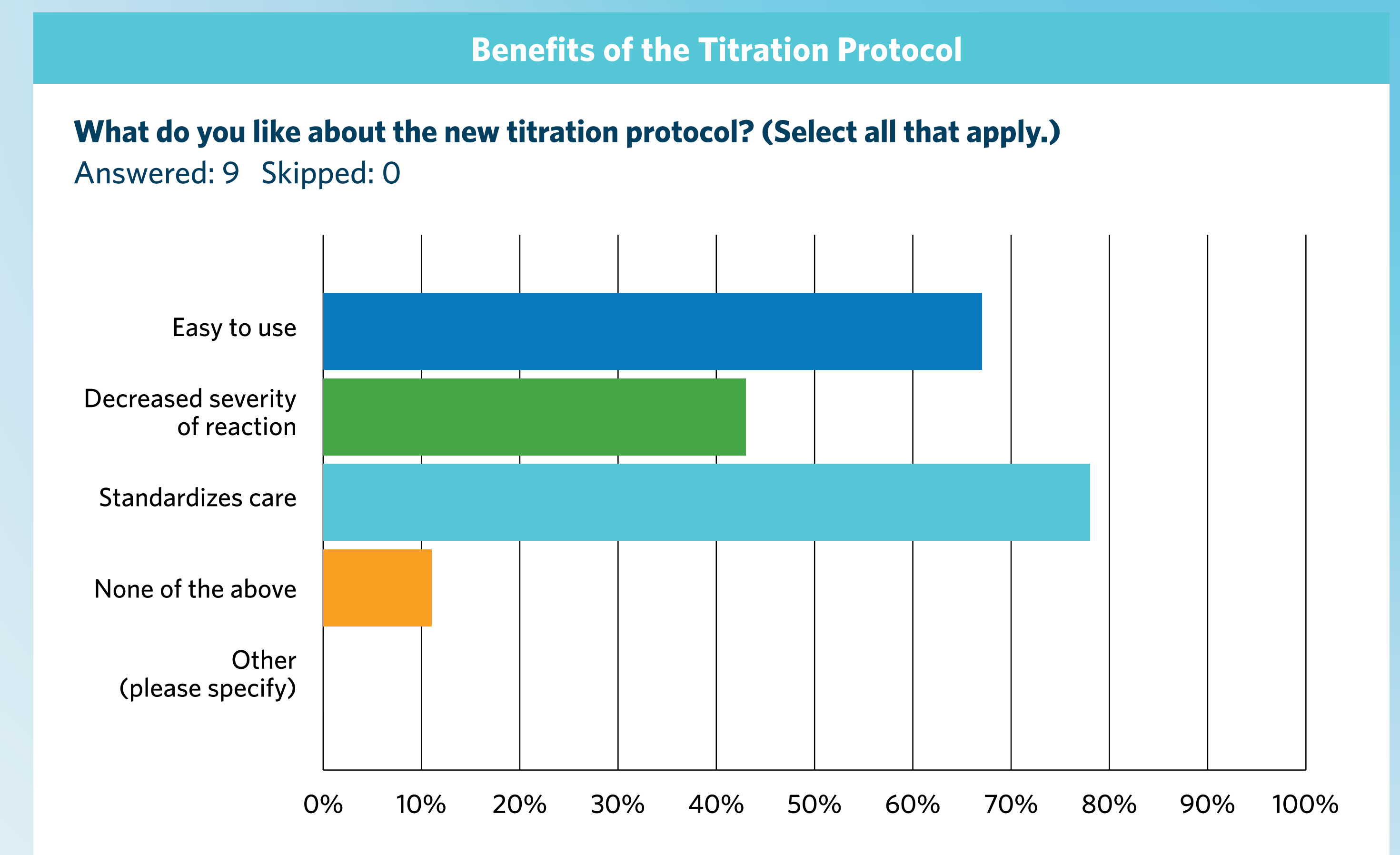
Results

All nine eligible nurses completed the post-implementation survey, and all respondents indicated they had the opportunity to use the new protocol. Six respondents felt the new protocol was beneficial, two did not find it beneficial, and one skipped the question (see Table 2). A multiple-choice question, with the option to select all answers that apply, asked nurses what they liked about the new titration protocol, and 77% felt it standardized care, 66% found it easy to use, and 44% felt it helped decrease the severity of reactions (see Figure 1). To assess the success of standardization, nurses were asked if they had administered a first or second taxane infusion and not used the titration protocol; eight respondents answered "no" and one skipped the question (see Table 2).

Table 2

Post-Intervention Titration Practices Survey			
Question	Have you used the new taxane titration protocol?	Do you find the new protocol beneficial?	Have you given a first or second taxane infusion and not used the protocol?
Total Responses	9	9	9
Yes	9 (100%)	6 (66.7%)	0
No	0	2 (22.2%)	8 (88.8%)
Question Skipped	0	1 (11.1%)	1 (11.1%)

Figure 1



Conclusions

This quality improvement project standardized the titration process for administration of first and second taxane infusions. This process was previously executed inconsistently, which introduced safety risks for patients and led to confusion for newly hired nurses. After the practice change, nurses reported it standardized care, was easy to use, and decreased the severity of HSR reactions. Limitations of this initiative included a lack of objective outcome data regarding HSRs since our only post-implementation measurement was nurses' perceptions of the new protocol. Future work should include measurement of HSR rates before and after protocol implementation to investigate the effect on HSR rates and severity. A strength of this project was the ease of adoption by nurses. Involving nurses in the discussion, collaborative decision-making to create the new protocol, and using an easy-to-follow protocol contributed to the success of this initiative.

References

- Lynch, D. M., Menon, S., Mazzola, E., Costa, J., & Jabaley, T. (2023). A three-step taxane titration protocol decreases hypersensitivity reactions during first and second exposures. *JCO Oncology Practice*, 19(6), e942-e950.
- Mendez, S., Culmone, K., Ramos, R., & Sweeney-Moore, A. (2021). Hypersensitivity reactions: Practice recommendations for paclitaxel administration. *Clinical Journal of Oncology Nursing*, 25(6), 713-716.
- Sefah, K., Kilowski, K. A., Gifford, S. A., Grove, A., Shaffer, J., Bryan, B., Ahmad, S., & Holloway, R. W. (2023). Standardized titration protocol reduces the incidence of paclitaxel infusion-related hypersensitivity reactions. *JCO Oncology Practice*, 19(12), 1199-1205.