

# ENHANCING THE SAFETY OF INJECTABLE CYTOTOXIC CHEMOTHERAPY AT A TERTIARY CARE HOSPITAL: A RETROSPECTIVE ANALYSIS OF PHARMACISTS' INTERVENTIONS IN CHEMOTHERAPY PREPARATION SERVICES

Aqila Taqi, Ali Al Jabri, Khurram Parvez, Maryam Al Belushi  
Pharmacy Department Sultan Qaboos University Hospital, Muscat, Oman

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## Background

- Cytotoxic chemotherapeutic agents are classified as high alert medications according to health accreditation standards.
- Detection of drug related problems (DRP) in chemotherapy prescriptions and resolving through pharmacist interventions (PI) was associated with an overall positive clinical and economic impact in international studies.

## Aim

- To describe the economic and clinical impact of interventions performed by pharmacists in the chemotherapy preparation unit at Sultan Qaboos University Hospital (SQUH).

## Method

- Design:** A retrospective analysis of pharmacists' interventions on injectable chemotherapy prescriptions between January and December 2021.
- Setting:** A tertiary care multi-speciality hospital in Oman. Chemotherapy including biologicals are centrally prepared within the pharmacy.
- Intervention:** Chemotherapy prescriptions were verified by trained pharmacists against set treatment protocols & in accordance to patients' clinical and laboratory parameters prior to preparation/mixing. Consequently, a proportion of prescriptions was withheld and differed to a later date. The remaining prescriptions were screened for any DRP and PI were then documented on a specific form that was incorporated into the electronic patient record. The process of verification is presented in (Fig.1).
- Study Measures:** The direct cost reduction of unprepared doses, and the grading of clinical significance of each intervention based on predefined criteria into: death, major, moderate and minor according to the associated potential harm prevented.

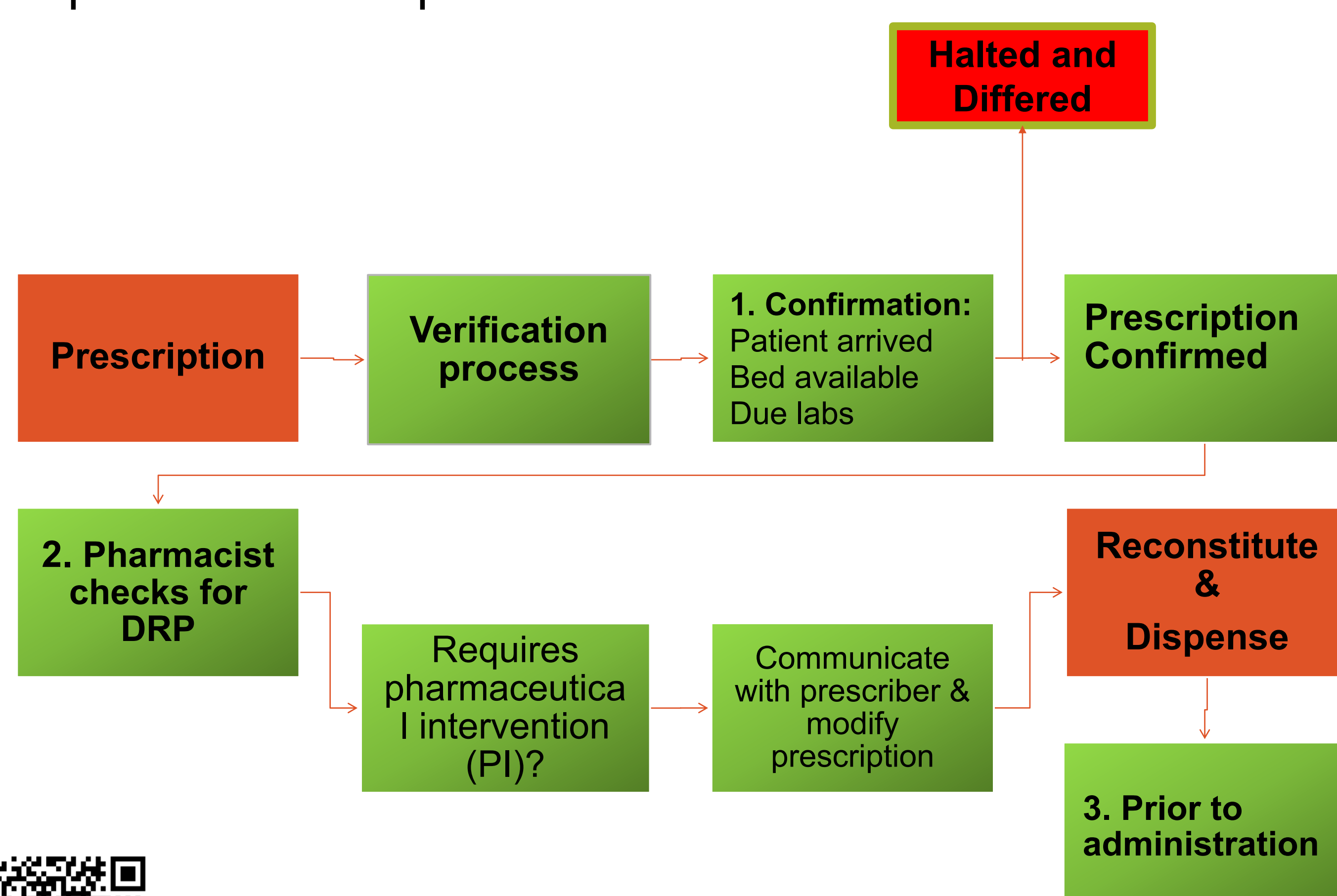


Figure1: The process of chemotherapy verification and pharmacist interventions (PI)

## Results

- A total of 18,408 individual drug prescriptions were received for 1,096 patients during 2021
- Out of them, 4,440 (24.1%) prescriptions entailed a change with the introduction of verification process.
- Prior to mixing, 4,069 orders (22.1% of total) were differed and the estimated potential direct cost reduction from the unprepared doses was around 1,000,000 Omani Rials (2,000,000 €) (Fig. 2)

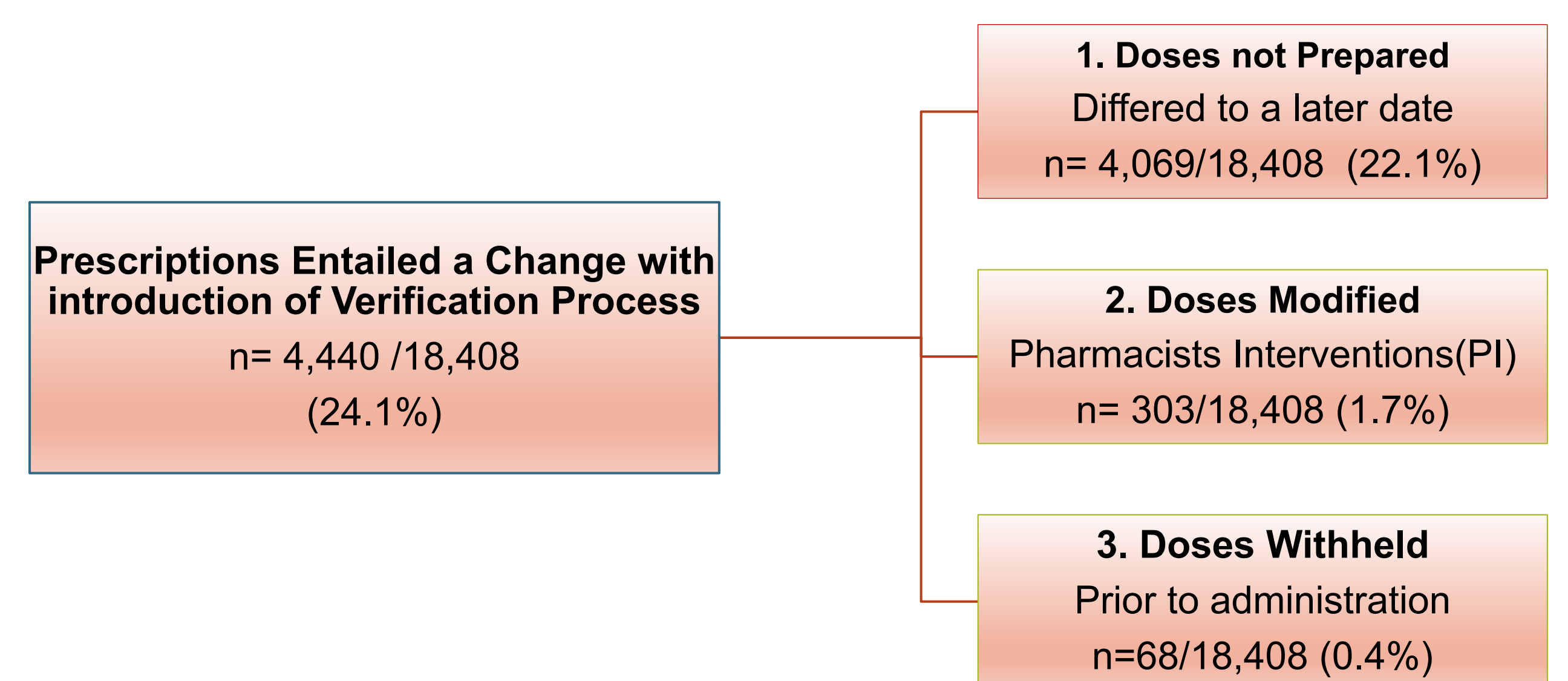


Figure 2: Proportion of prescriptions entailed a change with introduction of verification and required pharmacists' intervention

- A total of 303 DRP were identified and required a pharmacist interventions. The majority of interventions (96%) were accepted by the treating clinicians. Common DRPs & individual drugs involved in the interventions are shown in Fig.3 . Grading of clinical significance of the performed interventions are in Table 1.

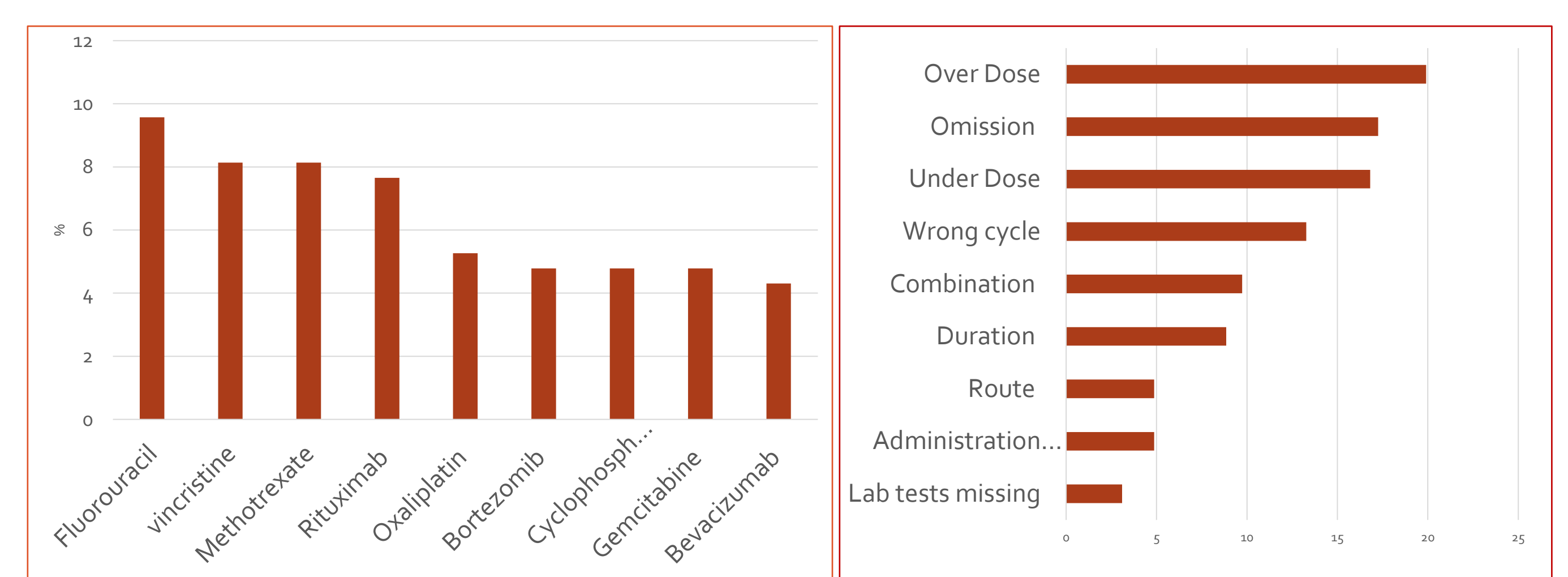


Figure 3 Most frequent DRPs and commonly involved individual drugs

Table 1: Grading of clinical significance of pharmacist interventions N=303

Grading of clinical significance	%	Examples
Death	1.6	Azacytidine 900 mg prescribed instead of eculizumab 900mg
Major	3.9	Vinblastine prescribed as 6mg/m2 (actual dose 1.5mg) while the correct dose was 0.2mg/kg in patients weighing <10kg
Moderate	41.0	Daunorubicin prescribed on days 1,2 & 3 instead of 1, 3 & 5
Minor	2.7	Intrathecal methotrexate prescribed as 10mg, child turned 3 that month , hence dose increase to 12 mg was recommended
Suboptimal practice	33.3	Dacarbazine 610mg was prescribed, recommended rounding off to 600mg
Not applicable	17.5	Information on medication availability provided to the prescriber

## Conclusion

Chemotherapy order verification & PI have minimized potential harms associated with cytotoxic chemotherapy regimens and resulted in considerable cost saving.

