

# Improving Clinical Response to Hypersensitivity Reactions in Adult Oncology Patients

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## Background

- Cancer is the **2<sup>nd</sup> leading cause of death** worldwide.
- In 2021, **1.9 million new cancer cases** are expected in US.
- Hypersensitivity reactions occur in about **5%** of patients receiving cancer treatment; **1-3%** progress to life threatening anaphylaxis.
- There remains **no standard guidelines** for the assessment and management of hypersensitivity reactions.
- Provider knowledge gaps and practice variations in hypersensitivity care leads to **increased patient distress, symptom prolongation, acuity escalations, and mortality risk.**

## Purpose and Aims

This quality improvement project evaluated whether a comprehensive symptom-based order set and practice guidelines would improve hypersensitivity management.

### Aims:

- 1) Determine whether **knowledge scores** of direct care staff increase with hypersensitivity education
- 2) Evaluate whether the use of the hypersensitivity management practice guidelines and enhanced order set **decreases the time to hypersensitivity reversal medication administration.**
- 3) Evaluate **staff satisfaction** of project interventions.

## Methods

Design	Setting	Sample	Sample Size	Ethical Review Approval Plan
Pre- and Post-Educational Survey Retrospective Chart reviews Post-Satisfaction Survey	32-Chair Ambulatory Infusion Unit, •Open 7 days/week  Large Medical System in California, USA	Staff: •RNs and APPs •≥ 2 years experience •Provide direct patient care  Patient: •Ages 18-100 •Receiving IV cancer treatments •Experience hypersensitivity reaction in unit	Staff Education: 34  Patient Chart Reviews: 84  Staff Satisfaction: 17	Johns Hopkins School of Nursing Project Ethical Review Committee (PERC)  Project Site Research Determination Office (RDO)

## Interventions

**Hypersensitivity education** was based on education and guidelines by the Oncology Nursing Society.

- Staff knowledge was evaluated through adapting the Drug Allergy Knowledge Survey and Asia Pacific Allergy Survey to convey oncology specific scenarios.

**Site specific practice guidelines and order set** were approved through multidisciplinary collaboration and stakeholder review.

Reversal medications included in the order set:

- Diphenhydramine
- Famotidine
- Corticosteroids
- Epinephrine

**Patient chart reviews** of each hypersensitivity occurrence evaluated reaction time, presenting symptoms, time to reversal medication administration, and symptom resolution time.

Post satisfaction was evaluated using a **5-point Likert scale convenience questionnaire.**

## Data Analysis

**Aim 1:** Survey scores were calculated using a percent of correct response. The individual scores were collated into a mean group score, then compared using a paired t-test.

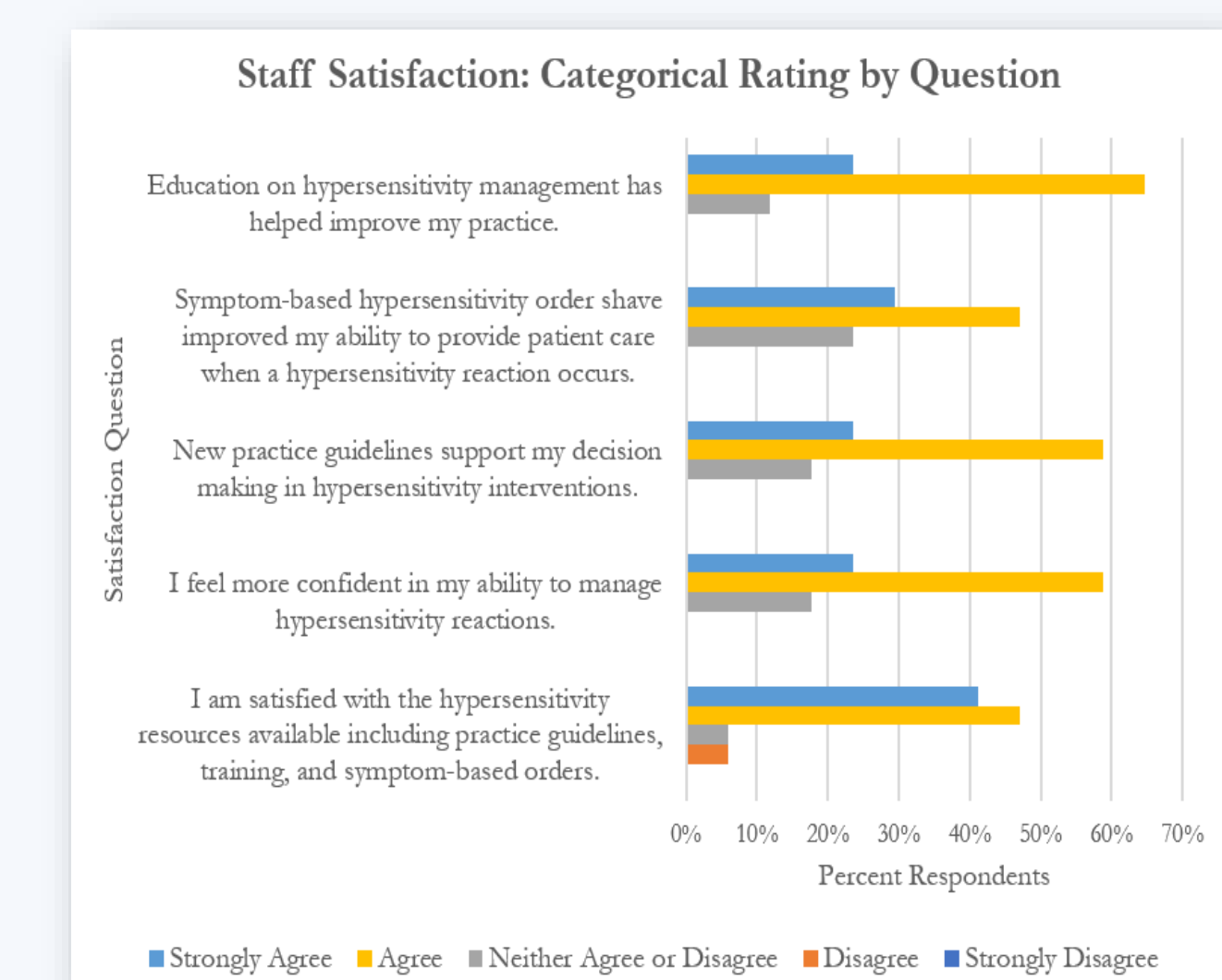
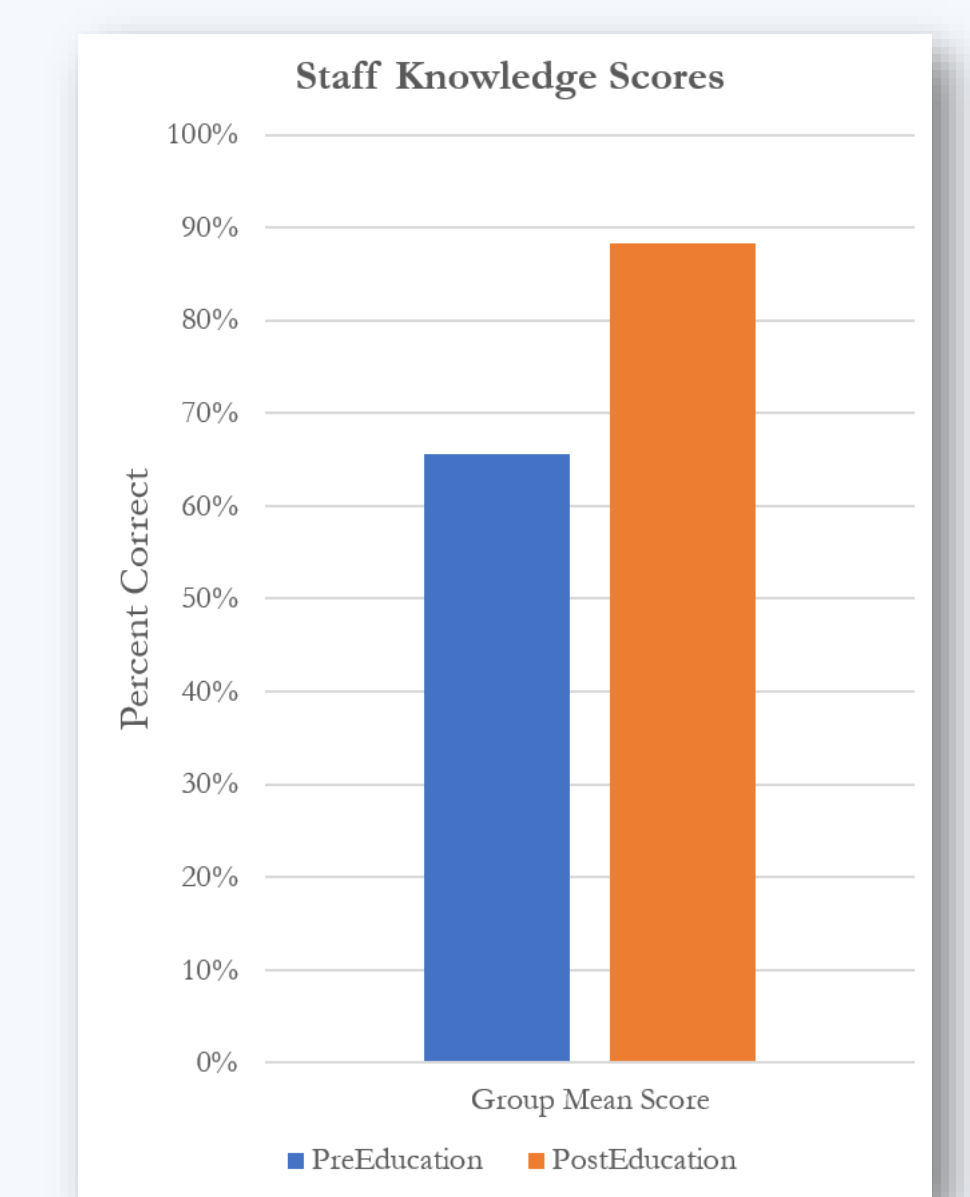
**Aim 2:** Time indicators of reaction occurrence, medication administration, and symptom resolution were compared pre- and post-intervention. A Mann-Whitney U test was used to determine statistical significance.

**Aim 3:** Descriptive statistics, including mean and categorical rating, were used to describe survey responses.

## Results and Limitations

- Mean knowledge scores showed statistical significance, **increasing from 65.5% to 88.24% (p <0.004).**
- Statistical and clinical significance were found, **improving administration times for Famotidine (p<0.038) and Corticosteroid (p<0.039) as well as symptom resolution (p<0.023).**
- Overall, **staff were satisfied** with project interventions.

Hypersensitivity Occurrence by Reversal Medication Administration and Symptom Resolution Time						
Measure	Project Component (Pre=1, Post=2)	Median	Interquartile Range	Minimum	Maximum	Independent Samples Mann-Whitney U Test p-values
Reaction to Diphenhydramine Administration	1	0:04:00	0:09:00	0:00:00	0:19:00	0.821
	2	0:05:00	0:08:00	0:00:00	0:20:00	
Reaction to Famotidine Administration	1	0:22:00	0:22:00	0:03:00	1:09:00	0.038
	2	0:09:00	0:07:45	0:02:00	0:34:00	
Reaction to Corticosteroid Administration	1	0:03:00	0:08:00	0:00:00	1:26:00	0.039
	2	0:05:00	0:04:45	0:00:00	0:51:00	
Reaction to Epinephrine Administration	No administrations observed pre or post intervention					
Reaction to Symptom Resolution	1	0:35:00	0:23:15	0:05:00	4:40:00	0.023
	2	0:46:00	0:18:00	0:01:00	1:41:00	



**Limitations:** coronavirus pandemic (e.g., frequent changes, change fatigue), project site work stoppage, limited project timeline, and one unit site selection.

## Future Implications

- There remains no standard guidelines for hypersensitivity management, however, **organizations have an obligation to support providers in clinical decision making and align with evidence-based practice.**
- The project outcomes are consistent with the literature showing focused education, order set protocol adoption, and practice guidelines can produce **reduction in time to intervention, increased patient safety, and enhanced quality care.**
- While Epinephrine administration was not observed in this project, staff communicated discomfort with administration. **Additional training and standardized protocol usage can be applied to improve staff ability and confidence** utilizing this life saving medication.