



Prevalence of Adverse Reactions to Carboplatin at Northwestern Medicine

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Disclosures


- Nothing to disclose

Learning Objectives

- Review what is already known about hypersensitivity reactions that take place during infusions of carboplatin
- Describe aims, approach and results of fellowship research project

Background

Ovarian cancer is the **fifth most common** cause of cancer death in women – responsible for more deaths than any other gynecologic malignancy



First-line medical treatment includes platin-based chemotherapy agents, specifically **carboplatin**



Patients can develop **acute reactions** during their infusions – reactions can be **variable** and can range from mild (*e.g.*, pruritus) to **life threatening** (*e.g.*, anaphylaxis).

Clinical features of hypersensitivity reactions to carboplatin

M Markman ¹, A Kennedy, K Webster, P Elson, G Peterson, B Kulp, J Belinson



- **205 patients** treated with carboplatin → **24 (12%)** developed an acute hypersensitivity reaction
- **13 patients (54%)** had a severe reaction including diffuse erythroderma, tachycardia, wheezing, dyspnea, emesis, hypertension and/or hypotension
- No characteristics were identified that could predict which patients would develop a severe reaction versus more moderate symptoms
- No information was provided regarding follow-up oncologic treatment plans for patients with HSR

Evaluation of the incidence of carboplatin hypersensitivity reactions in cancer patients

Marisa Navo ¹, Anuradha Kunthur, Martina L Badell, Larry W Coffey 2nd, Maurie Markman, Jubilee Brown, Judith A Smith

- Retrospective chart review of 1,324 patients receiving carboplatin over ~1 year
- 277 (21.0%) were ovarian cancer patients and 1,047 (79.0%) were patients with other malignancies (lung, other gynecologic-related cancers, head and neck)
- Incidence of carboplatin HSR was higher for ovarian cancer patients than patients with other malignancies (7.9% vs 2.6%)
- Primary risk factor for developing an HSR: ***prior carboplatin exposure***
- No assessment of severity of reaction nor subsequent oncologic treatment plans

Hypersensitivity reactions to chemotherapy: Outcomes and safety of rapid desensitization in 413 cases

Mariana C. Castells MD, PhD^{a*}  , Nichole M. Tennant BA^{a*}, David E. Sloane MD^{a*},
F. Ida Hsu MD^{a*}, Nora A. Barrett MD^a, David I. Hong MD^a, Tanya M. Laidlaw MD^a,
Henry J. Legere MD^a, Samridhi N. Nallamshetty MD^a, Ross I. Palis MD^a,
Jayanti J. Rao MD^a, Suzanne T. Berlin DO^b, Susana M. Campos MD^b,
Ursula A. Matulonis MD^b

- Carried out **413** drug desensitizations in **98** unique patients via 12-step rapid drug desensitization protocol
- **55** patients had initial reactions to carboplatin
- **40 (73%)** experienced an HSR during the 7th-10th exposure

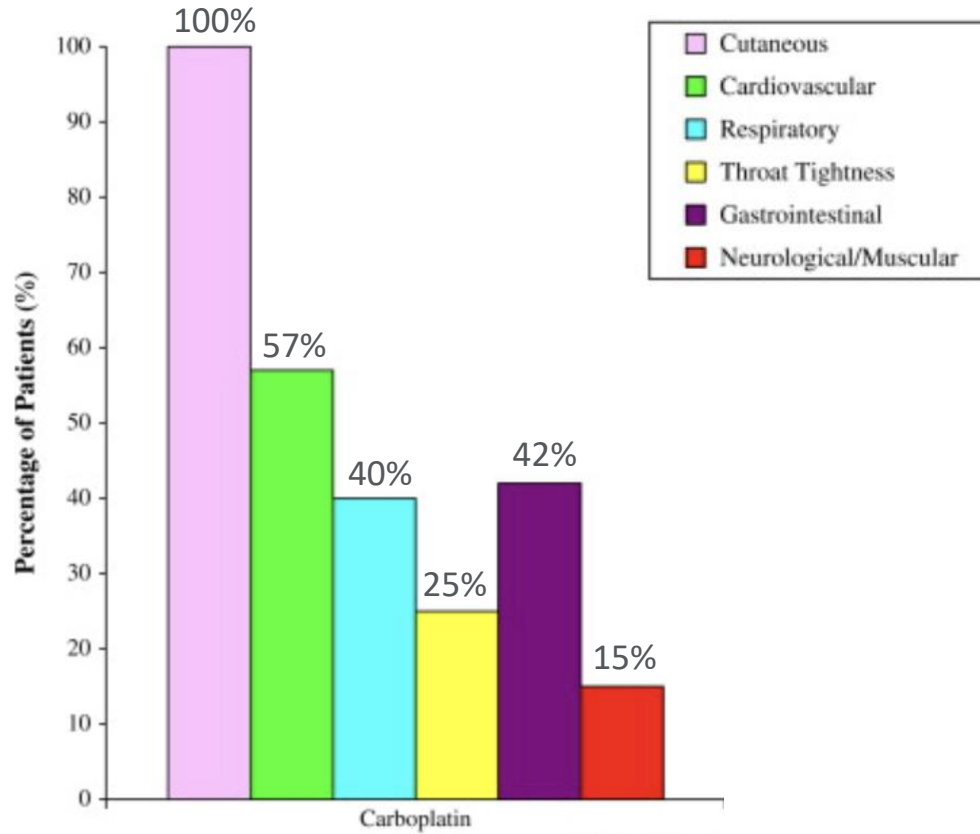


Fig 1. Frequency of symptoms and signs during initial HSRs.

Study Aims



Define the prevalence of carboplatin-induced anaphylaxis within our institution



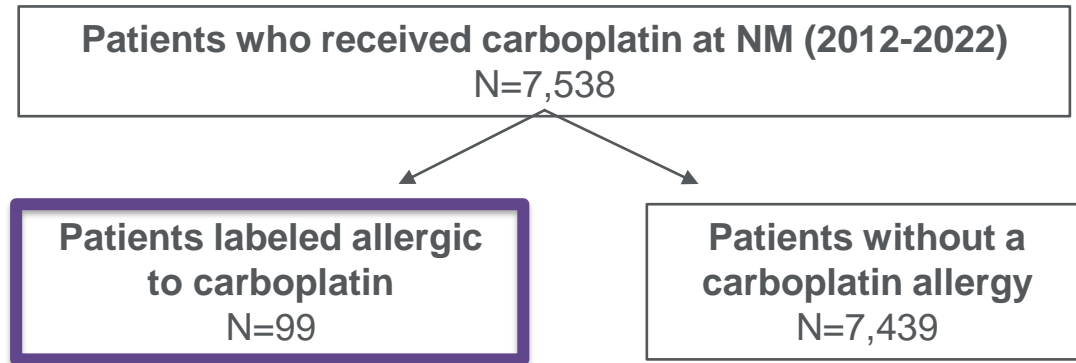
Extensively characterize the acute clinical reactions that occur during infusions of carboplatin



Assess how the development of acute infusion reactions to carboplatin impacted the subsequent oncologic treatment

Approach #1

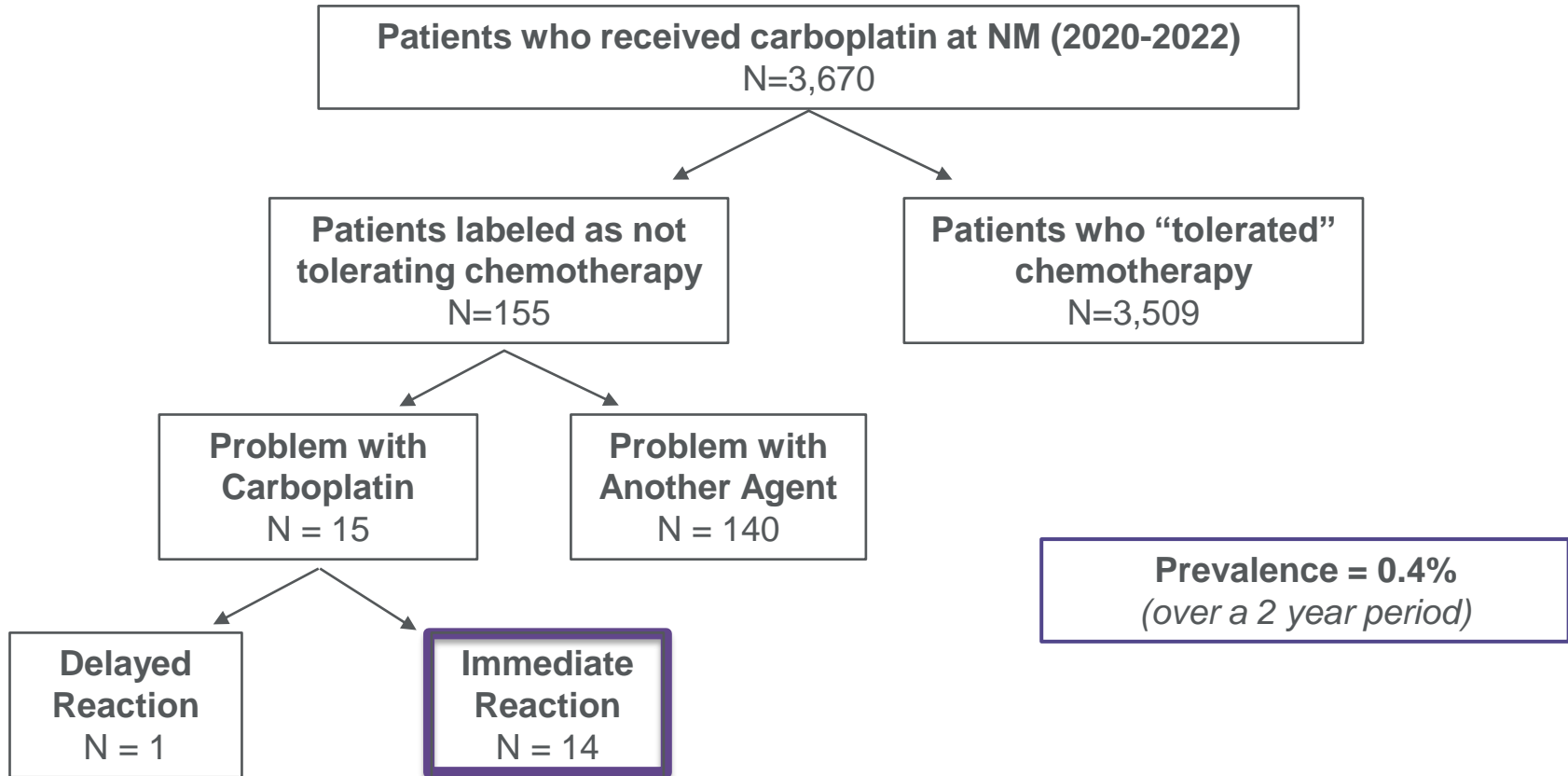
Patients with a documented allergy to carboplatin in their medical record



Prevalence = 1.3%
(over 10-year period)

Approach #2

Patients listed as “not tolerating” chemotherapy in their oncologic treatment plan

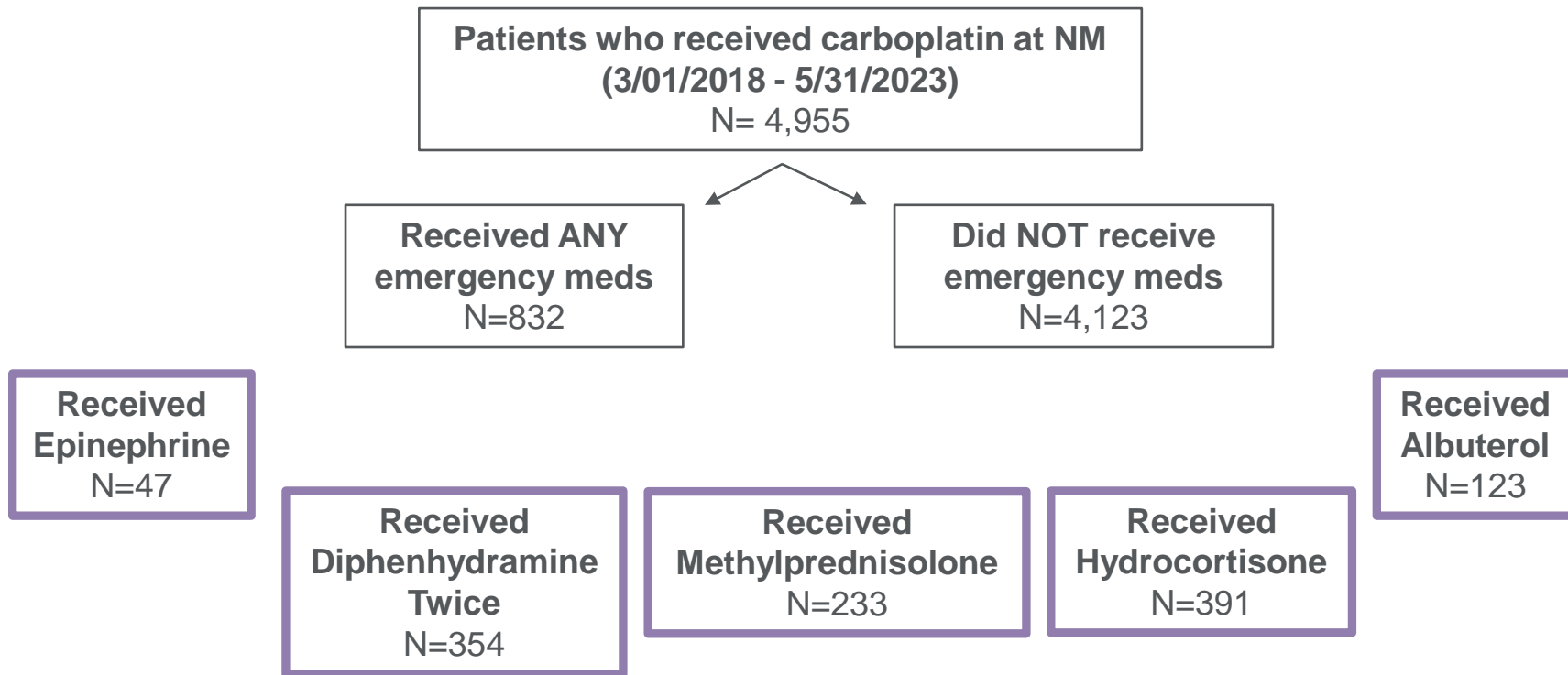


Medications Included in our EDW Query

- **Epinephrine**
- **Diphenhydramine**
- Famotidine
- **Methylprednisolone**
- **Hydrocortisone**
- Baclofen
- **Albuterol**
- Meperidine
- Prochlorperazine
- Acetaminophen

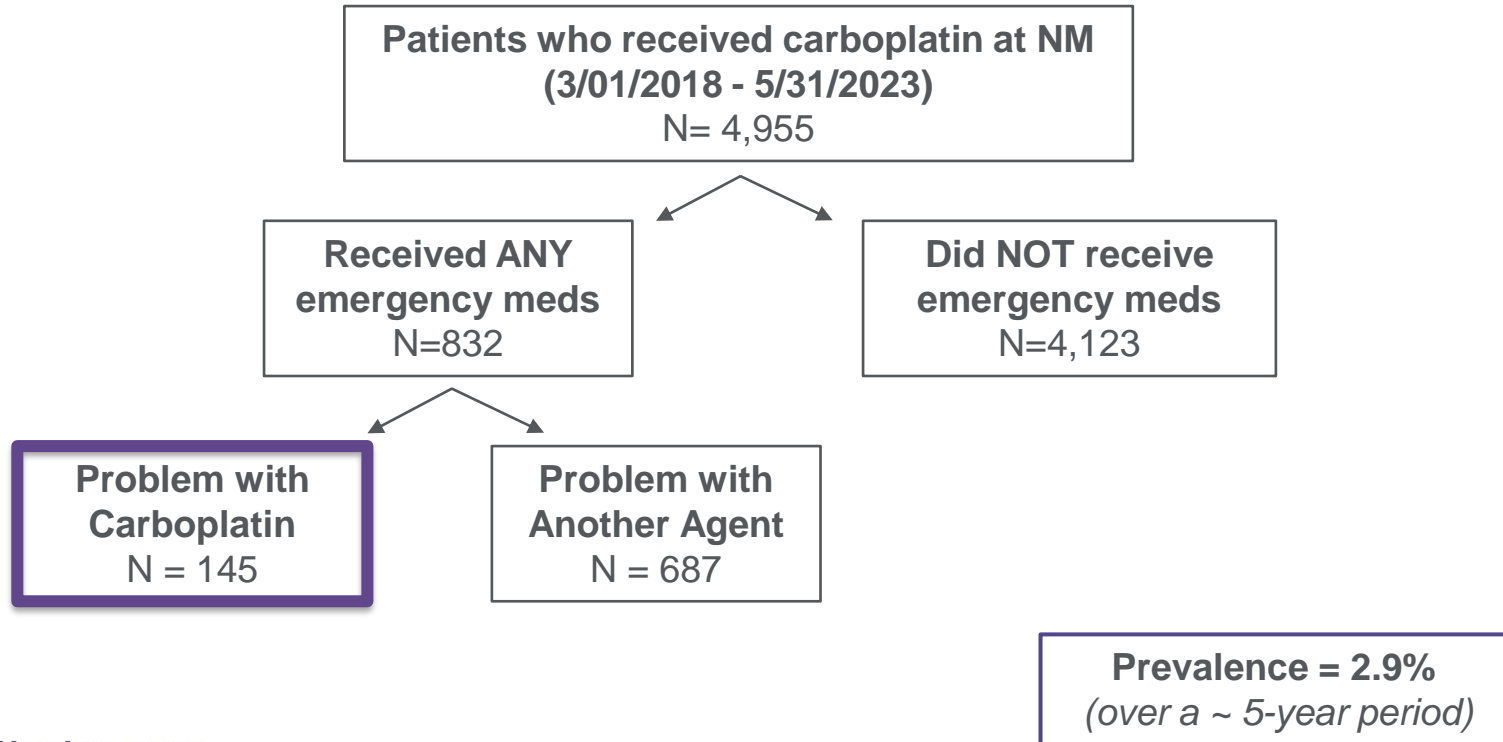
Approach #3

Patients who received emergency medication on the day they received carboplatin



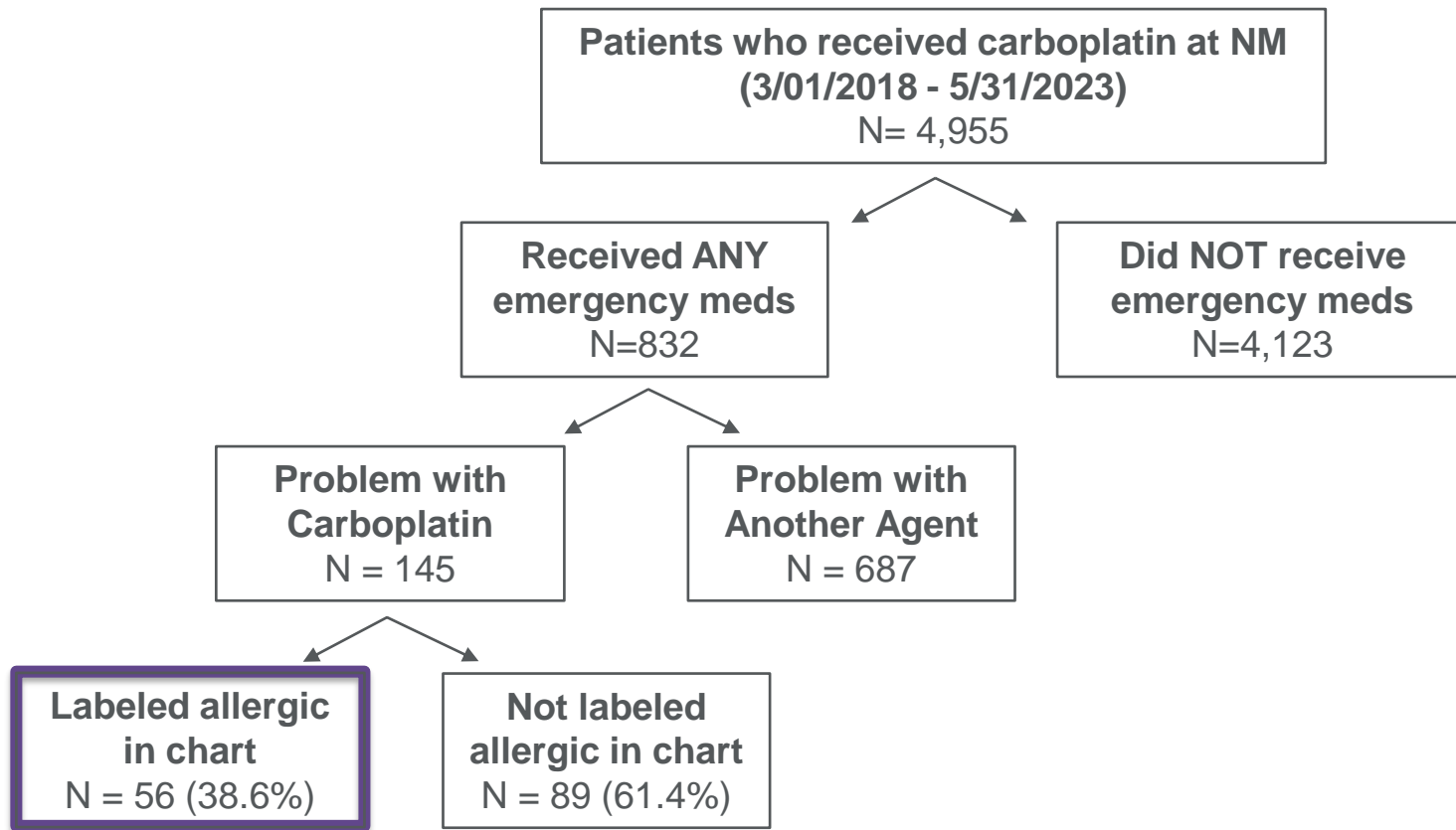
Approach #3

Patients who received emergency medication on the day they received carboplatin



Approach #3

Patients who received emergency medication on the day they received carboplatin



Study Aims



Define the prevalence of carboplatin-induced anaphylaxis within our institution – **2.9%**



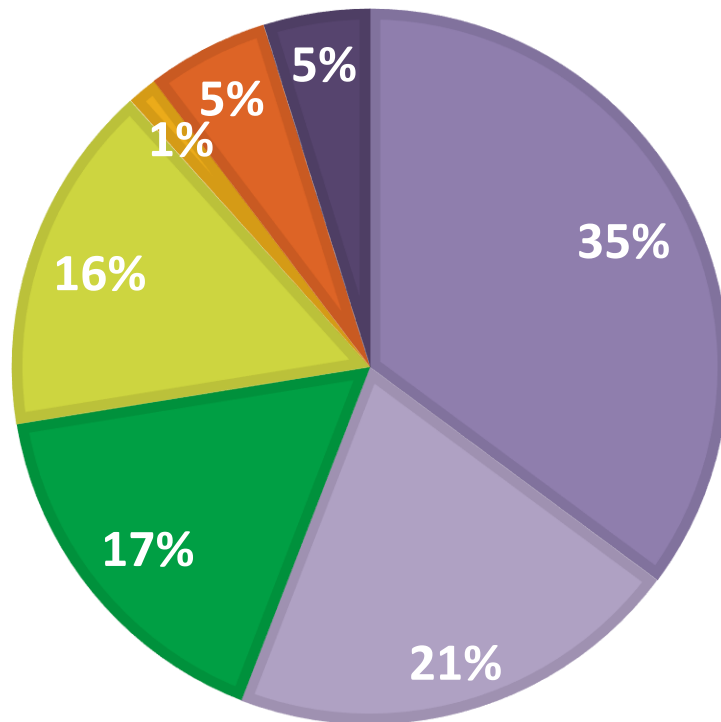
Extensively characterize the acute clinical reactions that occur during infusions of carboplatin



Assess how the development of acute infusion reactions to carboplatin impacted the subsequent oncologic treatment

Cancer diagnosis of patients receiving carboplatin

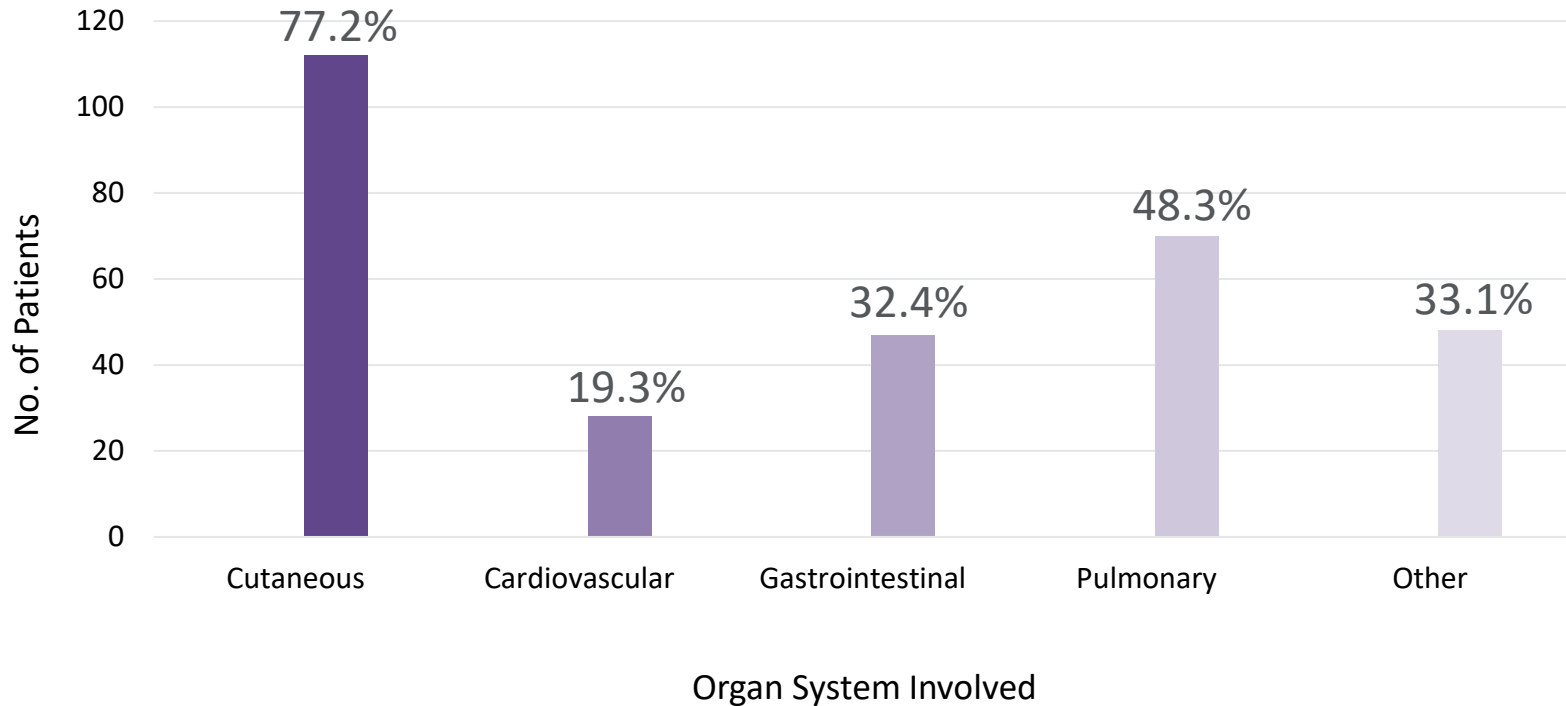
■ Ovarian ■ Breast ■ Lung ■ Endometrial ■ Cervical ■ Other Gyn ■ Other Non-Gyn



Demographics

Variable	n= 145
Age at Reaction (Years)	56.5 (29-84)
Gender	
Female	130 (89.7%)
Male	15 (10.3%)
Race	
White	106 (73.1%)
Black or African American	13 (8.97%)
Asian	8 (5.5%)
Native Hawaiian	1 (0.7%)
None of the Above	11 (7.59%)
Patient Declined to Respond	6 (4.14%)
Ethnicity	
Hispanic or Latino/a	21 (14.5%)
Not Hispanic or Latino/a	118 (81.4%)
Patient Declined to Respond	6 (4.14%)

Symptoms of Acute Reactions by Organ System

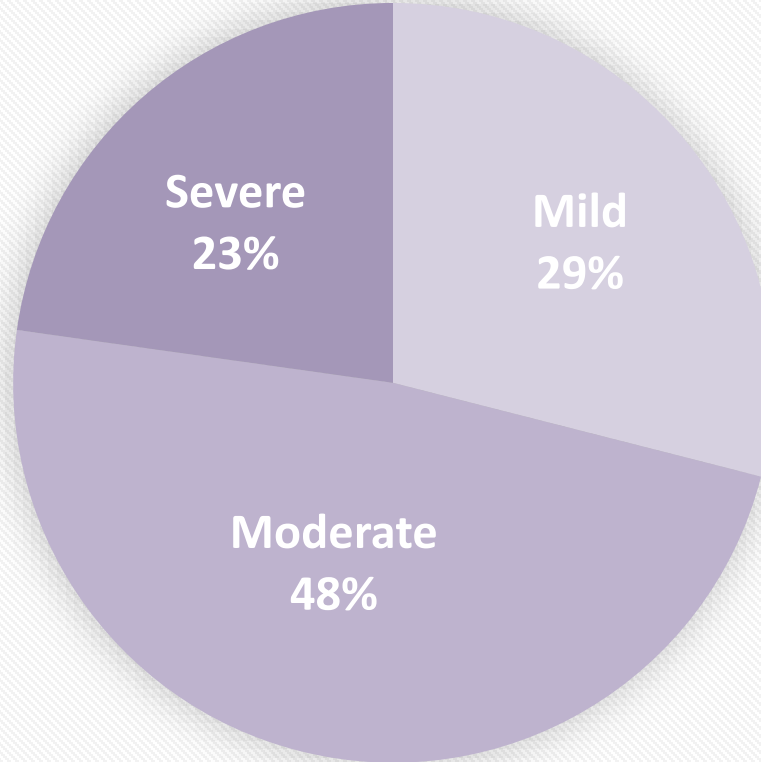


Classification of Reaction Severity – Brown's Criteria

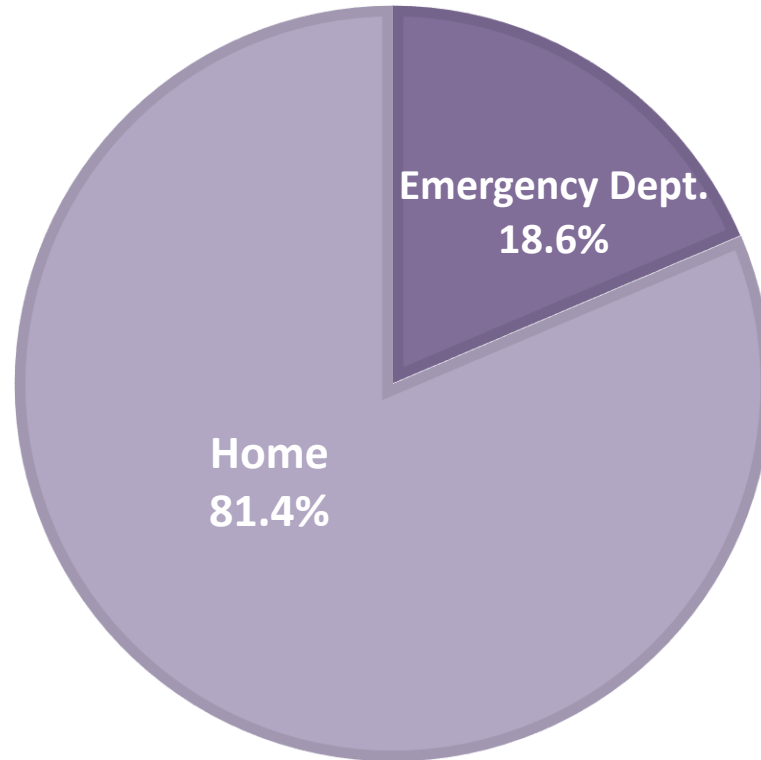
Grade	Severity	Description
1	Mild	Symptoms are limited to the skin (eg, flushing) or involve a single organ/system and are mild (eg, mild back pain).
2	Moderate	Symptoms involve at least 2 organs/systems (eg, flushing and dyspnea), but there is no significant decrease in blood pressure or oxygen saturation.
3	Severe	Symptoms typically involve at least 2 organs/systems, and there is a significant decrease in blood pressure (systolic ≤ 90 mm Hg and/or syncope) and/or oxygen saturation ($\leq 92\%$).

Severity of Acute Infusion Reactions to Carboplatin

By Brown's Criteria

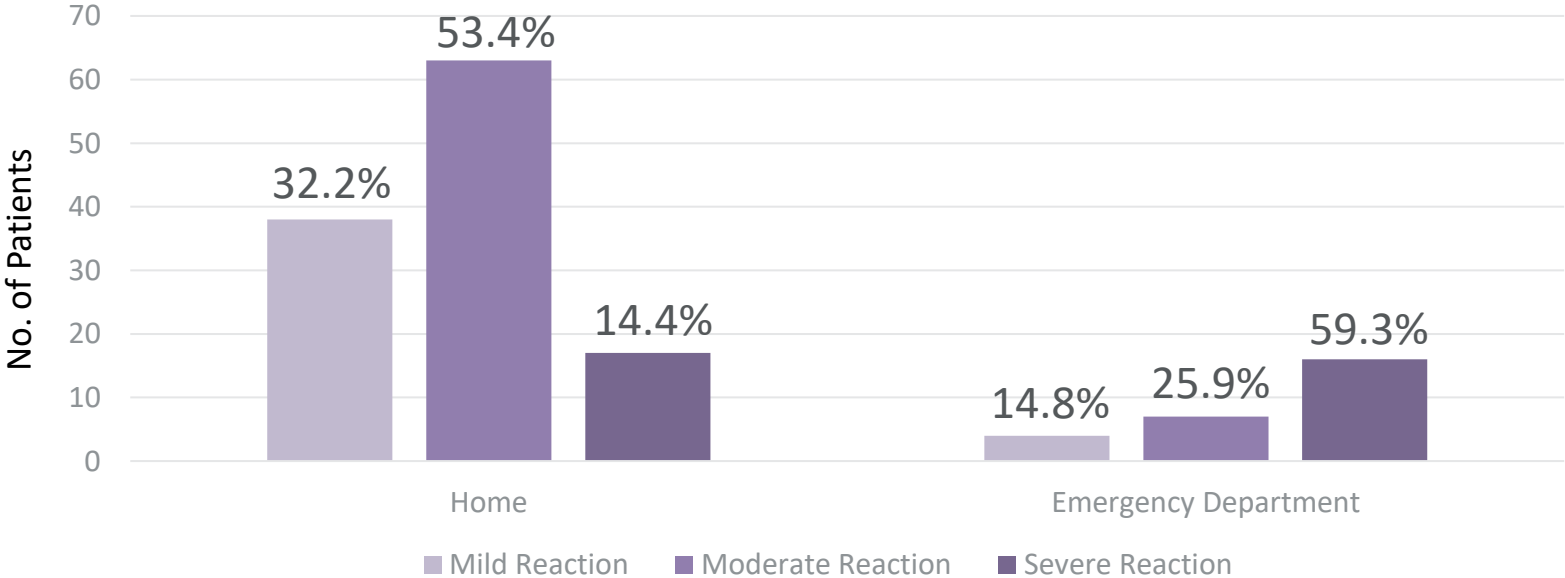


Patient deposition after acute reaction

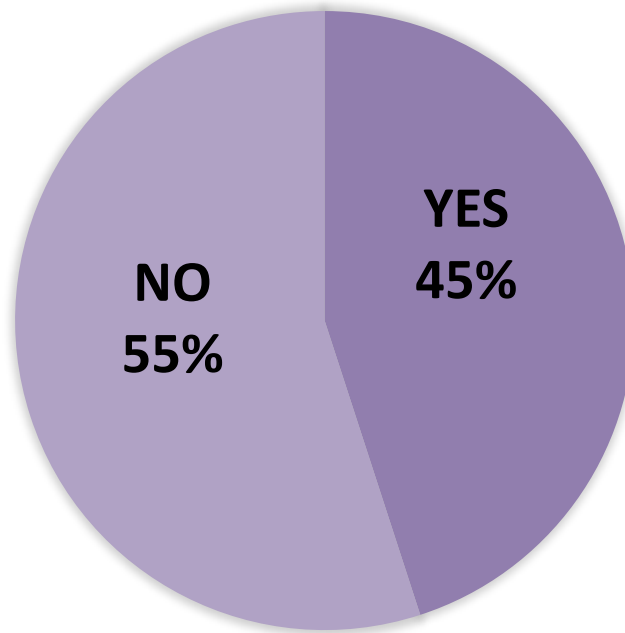


Severity of acute infusion reaction to carboplatin

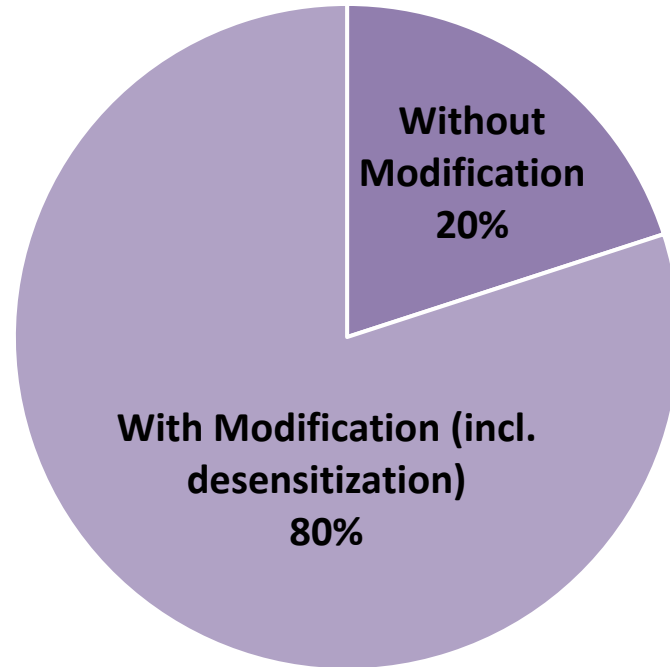
By patient disposition after the acute reaction



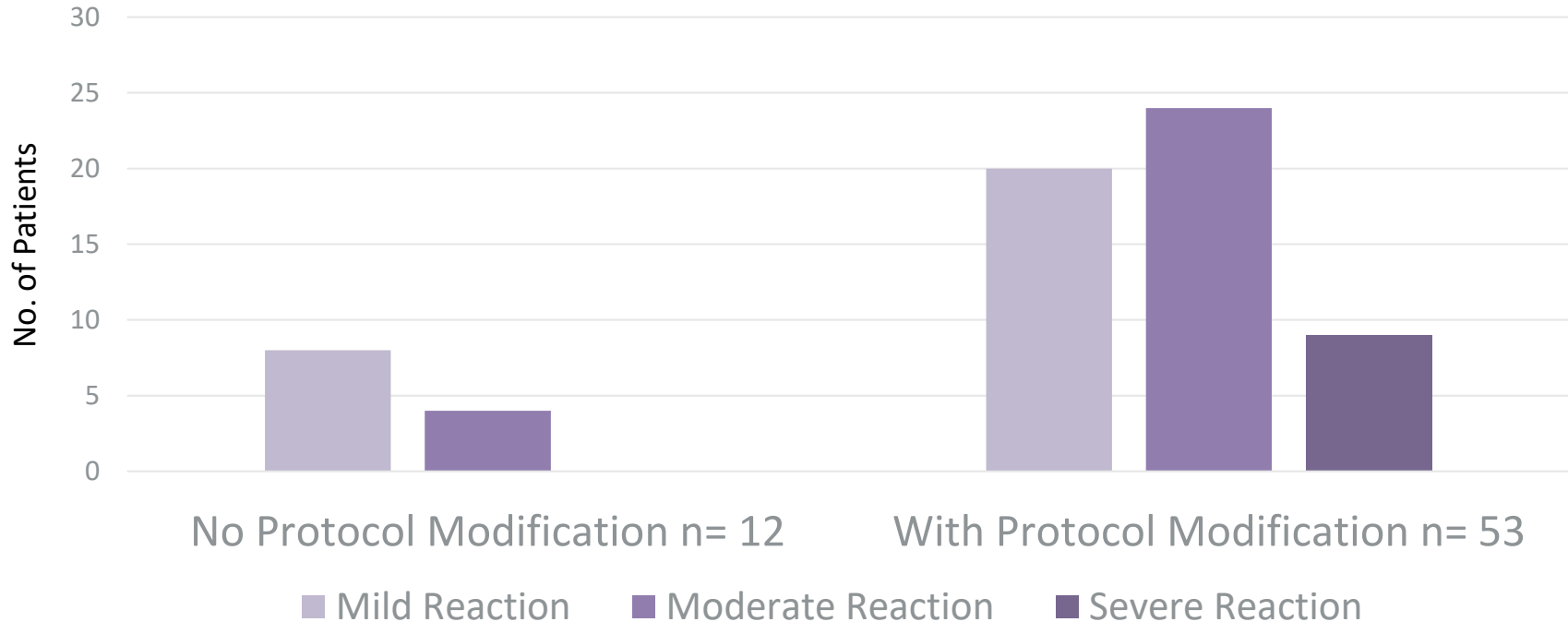
Continuation of carboplatin following the initial HSR



Infusion protocol modifications



Of those that received Carboplatin again...



Summary

- The prevalence of hypersensitivity reactions during carboplatin infusions at Northwestern appears to be ~3%
 - The majority of these patients were being treated for ovarian cancer (35%)
 - Most of the acute reactions had cutaneous and/or respiratory manifestations
 - Nearly half of the reactions were moderate in severity but 23% were severe
 - Less than half (45%) of patients with an acute infusion reaction received carboplatin again as part of the treatment regimen
 - The majority of patients (80%) who were restarted on carboplatin had a modification of some kind to their infusion protocol (additional pre-meds, slower rate of infusion, rapid drug desensitization)

Conclusions

- Prevalence of anaphylaxis to carboplatin is ~3% among all patients receiving carboplatin at Northwestern Medicine
- Not all patients who experience carboplatin anaphylaxis are appropriately labeled in the allergy section of their medical record

Ongoing (and Future) Directions

- Continue to characterize acute reactions to carboplatin and evaluate for any differences among the different malignancies
- Evaluate outcomes of patients with carboplatin hypersensitivity reactions in terms of future oncologic management
- Expand analysis to compare with acute infusion reactions to Taxol-based agents to assess for differences in the drugs

Acknowledgments

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Thank You