

Antineoplastic Infusion-Related Reactions

Management of Hypersensitivity Reactions



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08/13/2026

Aurora Cancer Care – Suite 980

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Learning Goals

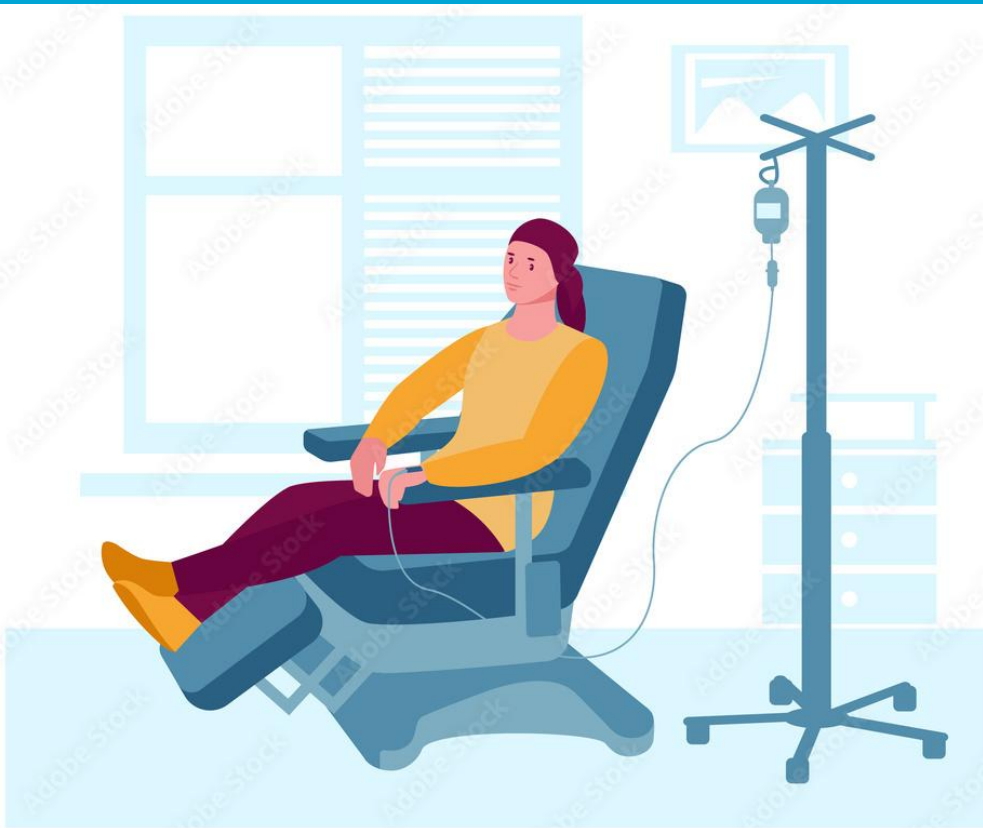
The learner will be able to do the following for each immune related and inflammatory emergency:

- Identify patients at risk
- Recognize the signs and symptoms
- Verbalize diagnostic tests if applicable
- Utilize appropriate nursing interventions

NOTE: Content of this presentation was taken from Understanding and Managing Oncologic Emergencies: A Resource for Nurses (Third Edition). Kaplan, 2018 unless otherwise indicated.



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Immune System Refresh

1st Line of Defense: Physical barriers and secretions

- **Physical/chemical barriers**
- Skin, mucus membranes, respiratory tract and secretions of sweat, saliva, tears, mucosal, ear wax
- Doesn't know or care what it is stopping

2nd Line of Defense: Inflammatory response (got through 1st line)

- **Nonspecific, innate**
- Hematopoietic cells: neutrophils, macrophages, mast cells, NK
- Phagocytosis: activates T cells through cytokines
- Histamine released: vessels dilate and leak allowing more types of WBCs to reach the area such as macrophages that consume the antigen
- **Complement cascade (system):** proteins that activate (specific or non-specific) and call on more macrophages. Cleans up the dead cells left behind

3rd Line of Defense: Recognition non-self using lymphocytes

- **Targeted/ Specific Adaptive Immunity**
- Recognition of non-self
- Goal: eliminate specific pathogens encountered previously by immune system
- B cells & T cells use humoral immunity (antibody-mediated)



Immune System Refresh Contd.

- **3rd Line of Defense:** (continued) **Targeted/ Adaptive Immunity**
 - **Memory T & B cells:** memory of antigen exposed to. This is where vaccines work
 - Finish the job using 1 of 2 ways:
 1. **Cell mediated:** Cytotoxic T Cells (WBC that can destroy cells infected by the antigen and causes apoptosis). Perforin is secreted>> cell death
 2. **Humoral Response:** B Cell mediated
 - Helper cell stimulate B cells >> antibody that is antigen specific
 - Antibodies are found everywhere (e.g. IgE)
 - B Cells can be activated by direct contact by antigens



Hypersensitivity Reactions (HSR): Overview

- Immunologic response to an antigen or foreign substance to which the body is exposed
- An exaggerated immune response
- 5 organ systems are targeted: integumentary (cutaneous), respiratory, CV, GI, and CNS
- **IgE, IgG or IgM mediated**: Quick response after exposure and stimulate mast cell activation which secretes histamine
- Reactions are classified into Types I-IV using the Gell and Coombs system
- Types I and IV are responsible for most immune mediated HSRs involving IgE
- Most mast cells are located in the skin, blood vessels, and GI tract with no specific target



Hypersensitivity Reactions (HSR): Overview

Anaphylaxis:

- Immunologic
- Subsequent doses (if not due to cross-reactivity)
- Acute reaction involves skin OR mucosa + GI w/ or w/o hypotension
- Classified as “true allergy”

Anaphylactoid & Drug Hypersensitivity:

1st or subsequent doses

May contain all or some symptoms of anaphylaxis

(Anaphylactoid) = Non-immunologic

(Drug Hypersensitivity) = Immunologic or non-immunologic, includes CRS and serum sickness

Complement activation-related:

1st dose

May contain all or some symptoms of anaphylaxis

Non-immunologic: complements C3a and C5a



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Hypersensitivity Reactions:

IgE Mediated Symptoms



Hypersensitivity Reactions: Type I

- IgE mediated involving three phases
 - **Phase 1: Sensitization to the foreign protein or drug**
 - **Phase 2: Re-exposure occurs and involves other chemical mediators**
 - **Phase 3: Mast cell influence (Effector Cells) on organ systems involved in immune defense**
- After sensitization, cross-linking of antigen to antibodies on mast cells
- Begin within seconds of administration with hives then progress to cardiopulmonary involvement
- Only a small amount of drug is needed to initiate an HSR, and reactions can occur during skin testing or desensitization
- E.g., Carboplatin reaction



Signs and Symptoms of Infusion Reactions

					
Neurologic and psychiatric	Respiratory	Cardiovascular	Cutaneous	Gastrointestinal	Other
Dizziness Headache Weakness Syncope Seizure Anxiety Sense of impending doom	Dyspnea Nasal Congestion Rhinitis Sneezing Oropharyngeal or laryngeal edema Bronchospasm Tachypnea Cyanosis Respiratory arrest	Tachycardia Hypotension Arrhythmia Chest pain Ischemia or infarction Cardiac arrest	Flushing Erythema Pruritus Urticaria Angioedema Rash	Nausea Vomiting Cramping Diarrhoea	Chills Fever

stay calm



Photo from: <https://open.spotify.com/album/0tnye4tiWOMjdIOYpxDEkP>

Anaphylaxis

Anaphylaxis

- Graded on severity and mediated by IgE
- Anaphylaxis reactions (IgE) vs anaphylactoid (non- IgE) but can mimic each other and require same treatment approach
- Typically involves multiple organs & considered a systemic response
- Dermatologic seen in 90%; respiratory seen in 70%; GI/Cardiac seen in 45%
- Symptoms range:
- Grade 1: itching, angioedema, urticaria
- Grade 2: grade 1 plus resp distress symptoms, N/V, hypertension, increased RR
- Grade 3: grade 1 & 2 plus loss of consciousness, dizziness, syncope, hypotension, laryngeal edema, more elevated RR



Hypersensitivity & Anaphylaxis

- Symptoms:
- Uneasiness/agitation
- Chest tightness
- SOB w/ or w/o wheezing
- Hypotension
- Urticaria/rash
- Itching
- Periorbital or facial edema
- Lightheadedness/dizziness
- Abdominal cramping, diarrhea, nausea, vomiting

Anaphylaxis

Treatment:

- Usually occurs within 30 min of start of infusion or when rate is increased
- Stop the infusion
- Infusion NS/maintain IV patency
- Stay with patient
- Supine-elevate legs if hypotensive
- Vitals Q 5-15 min
- Airway-O2
- EPINEPHRINE IM!!!
- Emotional support
- Watch closely
- Document the allergy as directed by the provider



File:Blausen 0018 Anaphylaxis.png - Wikimedia Commons

Incidence

- Often unreported especially if it is a non-life-threatening reaction.
 - Ensure you are educating patients about hypersensitivity symptoms so they are reported quickly. RESPONSE TIME IS ESSENTIAL!
- Variations can be seen with infusions of the same drugs at different times in the patient's treatment.
- Often the provider has no choice but to use an agent that previously caused a reaction because it is the best option but will add additional pre-medications.



Risk Factors

- Agent known to cause hypersensitivity
- Preexisting allergies: food, drugs, bee stings, contrast media
- Failure to give prophylactic meds
- Previous exposure to the agent
- Female gender
- History of asthma
- History of reaction to IV contrast
- **Greater than a year since last carboplatin dose**
- Bacteria derived agents (e.g., L-asparaginase)
- Elevated lymphocyte count
- Younger age



Common Causative Agents

Chemotherapeutic Agents:

- Liposomal Doxorubicin 45%
- Carboplatin (I,IV) 44%
- L-Asparaginase (I) 43%
- Paclitaxel (IV) 41%
- Oxaliplatin (7-8th dose) (I,II,III) 25%
- Cisplatin (I, IV) 20%

Immuno-/Biotherapy:

- Alemtuzumab 26-96%
- Gemtuzumab Ozogamicin 82%
- Denileukin Diftox 69%
- Immunoglobulins 44%
- Trastuzumab 40%
- Rituxumab (IV) 25%

Preventative Measures

Skin testing:

- Not always reliable
- Used for Bleomycin and ATG

Premedication:

- Antihistamine (anticipated histamine release)
- Drugs don't prevent the histamine release but inhibit the reaction
 - H1 (diphenhydramine)
 - H2 (ranitidine or cimetidine)
- Acetaminophen (for anticipated fever reactions)
- Corticosteroids (anticipated inflammatory reaction)
 - Prednisone
 - **Dexamethasone**

Rapid Desensitization:

- Administer multiple diluted incremental infusions (ranging from 3-12 and can last several days)
- Target reactions that involve IgE reactions (Type I)
- Used particularly for Carboplatin



Rescue Medications

⋮	sodium chloride (NORMAL SALINE) 0.9 % bolus 1,000 mL	Sign	Actions ▼	🗑
	1,000 mL ONCE PRN, Intravenous, Administer over 120 Minutes, If SBP > 90, Starting when released			
⋮	EPINEPHrine (ADRENALIN) 1 MG/ML injection 0.3 mg	Sign	Actions ▼	🗑
	0.3 mg EVERY 5 MIN PRN, Intramuscular, Hypersensitivity, Anaphylaxis, Starting when released, For 3 doses May repeat every 5-10 minutes for maximum of 3 doses. Epinephrine should be administered first, as soon as anaphylaxis is suspected. (Part of chemotherapy orders). Administer per policy as needed for hypersensitivity/anaphylaxis reactions with chemotherapy/biotherapy drugs.			
⋮	diphenhydramINE (BENADRYL) injection 50 mg	Sign	Actions ▼	🗑
	50 mg ONCE PRN, Intravenous, Hypersensitivity, Anaphylaxis, Starting when released Administer per policy as needed for hypersensitivity/anaphylaxis reactions with chemotherapy/biotherapy drugs.			
⋮	famotidine (PEPCID) injection 20 mg	Sign	Actions ▼	🗑
	20 mg ONCE PRN, Intravenous, Other, Hypersensitivity/anaphylaxis, Starting when released Dilute with 5 mL-10 mL NaCL 0.9%. Give each 20 mg over 2 minutes. Administer per policy as needed for hypersensitivity / anaphylaxis reactions with chemotherapy / biotherapy drugs. * Refrigerate * Dilute with 5 mL-10 mL NaCL 0.9%. Give each 20 mg over 2 minutes.			
⋮	methylPREDNISolone (SOLU-Medrol) injection 125 mg	Sign	Actions ▼	🗑
	125 mg ONCE PRN, Intravenous, Hypersensitivity/anaphylaxis, Starting when released Reconstitute vial with 2 mL sterile water (conc = 62.5 mg/mL). Administer per policy as needed for hypersensitivity/anaphylaxis reactions with chemotherapy/biotherapy drugs. Reconstitute vial with 2 mL Sterile Water. (Conc = 62.5 mg/mL) * Protect from Light * If using a powder vial without the diluent as part of the vial, reconstitute the 125 mg vial with 2 mL Sterile Water for injection. Resulting conc = 62.5 mg/mL.			
⋮	albuterol inhaler 2 puff	Sign	Actions ▼	🗑
	2 puff EVERY 20 MIN PRN, Inhalation, Shortness of Breath, Wheezing, Starting when released, For 3 doses Shake well before use.			
⋮	albuterol (VENTOLIN) nebulizer 5 mg	Sign	Actions ▼	🗑
	5 mg EVERY 20 MIN PRN, Nebulization, Shortness of Breath, Wheezing, Starting when released, For 3 doses			
⋮	morphine injection 2 mg	Sign	Actions ▼	🗑
	2 mg PRN, Intravenous, Rigors, Starting when released, For 2 doses May repeat x1 for maximum of 2 doses.			
⋮	Oxygen Administration Nasal Cannula	Sign	Actions ▼	🗑
	Routine, PRN, Starting when released, Until Specified Titrate to keep SpO2 >= 92%.			





Let's Focus on
IM Epinephrine

Epinephrine IM Advantages vs IV

Alleviate your fears of IM Epinephrine!

- Always be prepared to administer IM epinephrine
- Do NOT hesitate if the symptoms are present!
- This drug can save the life of your patient
- Remember the IM version will not cause the same cardiac side effects as IV



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IM vs. IV Epinephrine

IM Epinephrine	IV Epinephrine
Less peak effect	Longer lasting effects
Acts on Beta 2 receptors : Smooth muscle relaxation and bronchodilation	Acts on Alpha 1 receptors : Vasoconstriction> increased b/p and HR
No vasoconstriction of coronary arteries	Causes vasoconstriction of coronary arteries- similar to heart attack
NO CARDIAC monitoring required	Cardiac monitoring required
Signed order & RN to administer **Can be given in epi-pen as well	ACLS required
Dosage of 1:1,000 or 0.3 to 0.5mg	Higher risk of dose error; Dosage 1:10,000 or 1mg
IM injection - anterolateral thigh	Administered IV push or drip



Cytokine Release Syndrome

Overview:

- Symptom complex associated with the use of many monoclonal antibodies caused by B Lymphocyte stimulation
- Release of cytokines from cells targeted by the antibody as well as immune effector cells (lymphocytes) recruited to the area
- Generally seen in first infusions and decrease with subsequent infusions

Risk Factors:

- First infusions
- Chemo-naïve patients receiving MoAbs
- Leukemia or Lymphoma
- High circulating lymphocyte count ($>25,000/\text{mm}^3$)



Cytokine Release Syndrome

Symptoms:

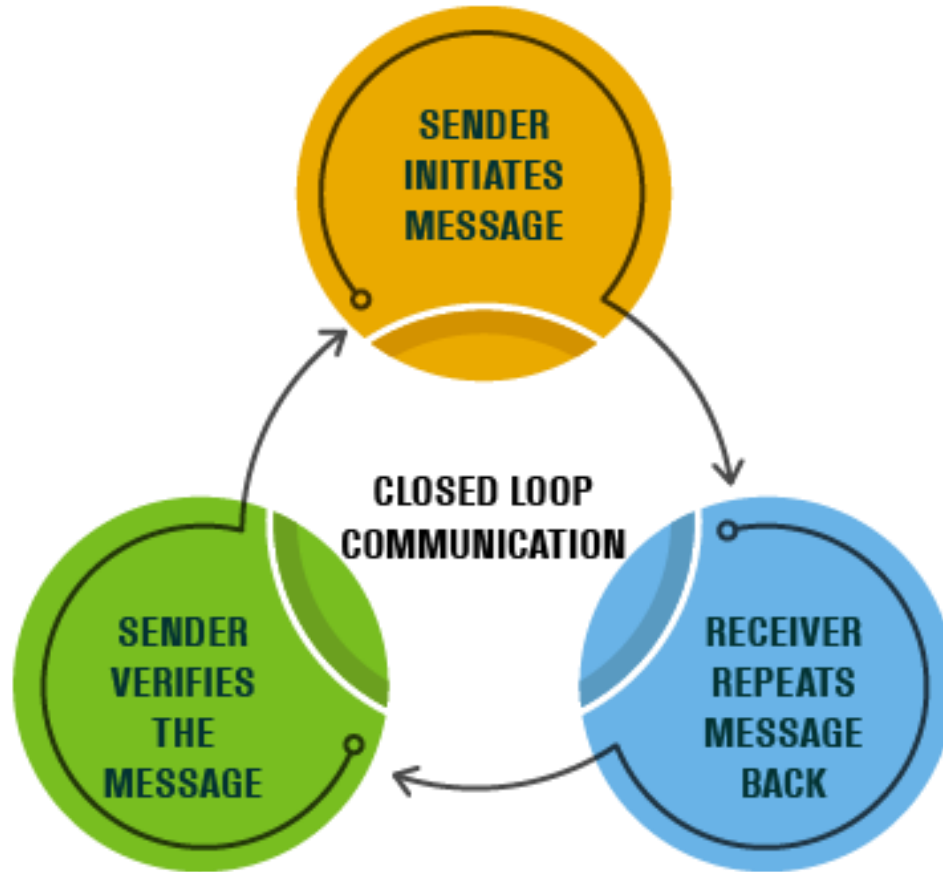
- Fever/chills
- Nausea
- Hypotension
- Tachycardia
- Asthenia (profound weakness/fatigue, lack of energy or strength)
- Headache
- Rash
- Tongue/throat swelling
- Dyspnea

Cytokine Release Syndrome Management

Treatment:

- Stop infusion-stay with patient until symptoms resolve (about 30 min)
- Administer additional histamine blockers and corticosteroids
- Resume infusion at slower rate (50%) after resolution of symptoms
- If severe symptoms occur, administer meds according to symptoms





[Image: Closed-Loop Communication | AHA TeamSTEPPS Video Toolkit | AHA](#)

Scenario 1

T.S. is a 60-year-old patient with endometrial cancer.

She is presenting to the clinic for Day 1 Cycle 1 adjuvant Paclitaxel + Carboplatin.

This is the first time the patient has received chemotherapy.

Allergy: Oxycodone – nausea/vomiting

ECOG: 0



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Scenario 1 Contd.

Review of Systems

General: The patient is alert, well-developed, well-nourished, no distress.

Skin: Warm, normal color, normal texture, normal turgor and without rash.

Head: Normocephalic, atraumatic.

Neck: Supple with no significant adenopathy.

Eyes: Normal conjunctivae and sclerae. Pupils equal, round, reactive to light and accommodation. Extraocular movements intact.

ENT: Mucous membranes are moist. Normal nose, mouth and throat.

Cardiovascular: Regular rate and rhythm, no murmurs, gallops or rubs.

Respiratory: Normal respiratory effort. Clear to auscultation. No wheezes, rales, or rhonchi.

Abdomen: Abdomen is soft and non-tender with active bowel sounds. There is no detected hepatosplenomegaly, masses, or ascites.

Extremities: No clubbing, no cyanosis, no edema. Normal muscle tone and development bilaterally.

Lymph: No cervical, supraclavicular, axillary, inguinal lymphadenopathy.

Neurologic: Motor strength normal. Coordination normal. No tremor noted.

Psychiatric: Cooperative. Appropriate mood and affect. Normal judgment



Scenario 1 Contd.

Vital Signs

BP	130/60
Heart Rate	78
Resp	18
Temp	98.2 °F Oral
SpO2	99 %
Weight	227 lb 8.2 oz (103.2 kg)
Height	5' 2.36" (1.584 m)
Pain Score	0

Labs

WBC	4.2
RBC	4.03
HGB	10.7↓
HCT	34.4↓
PLT	225
Absolute Neutrophils	2.3
Absolute Lymphocytes	1.6
Absolute Eosinophils	0.1
Absolute Basophils	0.0

Glucose	162↑
Sodium	136
Potassium	3.6
Chloride	102
Carbon Dioxide	27
BUN	8
Creatinine	0.73
Calcium	8.6
Protein, Total	7.2
Albumin	3.3↓
GOT/AST	14
GPT/ALT	13
Alkaline Phosphatase	159↑
Bilirubin, Total	0.5

Scenario 1 Contd.

Medication

Premedication

- Dexamethasone 12 mg + Ondansetron 16 mg IVPB over 15 minutes
 - Given: 0930-0945
- Famotidine 20 mg IVP over 2 minutes
 - Given: 0927
- Diphenhydramine 25 mg IVP over 2 minutes
 - Given: 0927
- Fosaprepitant 150 mg IVPB over 20 minutes
 - Given: 0931-0951

Paclitaxel 354 mg in 500 mL of sodium chloride ($175 \text{ mg/m}^2 \times 2.03 \text{ m}^2$)

- Admin Instructions: FIRST AND SECOND INFUSION: Start infusion at an initial rate of 2 mL/hr for 15 minutes. If hypersensitivity or infusion-related events do not occur, increase the infusion rate to 20 mL/hr for 15 minutes. If tolerated, increase to full rate for the remainder of the infusion.
Paclitaxel infusion started @ 1009 at 2 mL/hr

Rate Change @ 1030 to 20 mL/hr

Rate Change @ 1046 to 199.7 mL/hr

At 1052, the patient started to complain of flushing, rigors, and was pruritic.



Scenario 1 Contd.

What would be your next steps?



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Scenario 1 Contd.

Repeat Vitals @ 1053:

BP	120/58
Heart Rate	72
Resp	20
SpO2	96 %

Based on the assessment and vitals, what medications and/or supportive care would you administer to the patient?



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Scenario 1 Contd.

Patient is experiencing a mild reaction. Patient to receive diphenhydramine 50 mg IV and morphine 2 mg IV for rigors. Patient should be continuously assessed, and vitals monitored until the patient improves or symptoms worsen. May restart medication if vitals remain stable and symptoms improve.



Scenario 1 Contd.

Rigors improve, as does the pruritus, and her vitals remained relatively stable. However, the patient starts to complain of nausea and vomiting, shortness of breath, and anxiousness. She continues to be flushed. Patients' vitals were assessed and were as follows:

Vital Signs @ 1111

BP	60/42
Heart Rate	79
Resp	20
SpO2	91 %

Next Steps?



Scenario 1 Contd.

Medications/Supportive Cares to Be Given:

- 0.3 mg Epi IM
- Hang IV Fluids
- May also administer methylprednisolone 125 mg IV, famotidine 20 mg IV, oxygen via nasal cannula (titrated to keep SpO2 above 92%)
- If possible, patient should be placed in a supine position and elevate the legs.
- Emergency services should be called. Epinephrine may be repeated every 5-10 minutes, for a maximum of 3 doses if needed.
- Patient continues to be monitored in the clinic until emergency services arrive and patient is sent to the ED.

Scenario 1 Contd.

Vital Signs @ 1113:

BP	84/45
Heart Rate	81
Resp	18
SpO2	97 %

Vital Signs @ 1119:

BP	97/54
Heart Rate	84
Resp	18
SpO2	98 %

Emergency Services arrives at 1122
and patient is transport to the ED.



Scenario 1 Debrief

- The patient initially presented with a mild reaction with rigors.
- **Mild reactions can typically be treated successfully with the use of diphenhydramine.**
- The patient should receive morphine related to the rigors.
- ***Mild reactions typically are associated with symptoms that are cutaneous or subcutaneous only*** (generalized erythema, periorbital edema, urticaria, angioedema).
- Even though the mild reaction was treated appropriately, the patient progressed to an anaphylactic reaction.
 - **Because anaphylaxis is potentially life threatening, it needs to be identified immediately and treated with epinephrine.** The only medication that can reverse life-threatening symptoms of anaphylaxis is epinephrine.
- Life threatening or anaphylactic reactions typically include hypoxia, hypotension, or neurologic compromise (Cyanosis or $\text{SpO}_2 \leq 92\%$ at any stage, hypotension (SBP (90 mmHg), confusion, collapse, loss of consciousness, incontinence). These symptoms can be in conjunction with symptoms of less severe reactions.



Scenario 1 Debrief Contd

- Patients should be monitored until symptoms of anaphylaxis have fully resolved.
 - However, there is no consensus that exists on the required observation time.
 - **Patients with severe anaphylaxis and those that require more than one dose of epinephrine are at an increased risk for biphasic reaction (symptoms of anaphylaxis may recur hours after the initial intervention); therefore, emergency department monitoring, or hospital admission should be considered.**
- If a patient experiences a life-threatening reaction, the medication should not be restarted. Patients should be considered for drug desensitization with subsequent doses.

When there is a concern for a hypersensitivity reaction, the first and most important steps are to stop the medication, obtain vital signs, ensure the IV line is patent with normal saline, retrieve emergency medications and call for help. The RN that identifies the reaction should stay with the patient to initiate interventions while others call for help.



Scenario 1 Debrief Contd

Patients should be assessed for anaphylaxis and that is determined by the following:

1. Acute onset of an illness (minutes to hours) with involvement of:
 - a. **Skin/mucous membranes** (hives, generalized itch/flush, swollen lips/tongue/uvula) **AND** as least 1 of the following:
 - i. **Respiratory compromise:** severe SOB with SpO₂ < 90% or >10% drop from baseline SpO₂, dyspnea, wheeze/bronchospasm, stridor, reduced peak expiratory flow, hypoxemia
 - ii. **Reduced blood pressure:** hypotension (acute drop in SBP (90 mmHg or > 10% from baseline SBP of 90 mmHg or less), hypotonia (collapse), syncope, incontinence.
2. **Two or more** of the following that occur rapidly after exposure (minutes to several hours):
 - a. Involvement of skin/mucous membranes: generalized hives, itch/flush, swollen lips/tongue/uvula
 - b. Respiratory compromise: severe SOB with SpO₂ < 90% or >10% drop from baseline SpO₂, dyspnea, wheeze/bronchospasm, stridor, reduced peak expiratory flow, hypoxemia
 - c. Reduced blood pressure: hypotension, collapse, syncope, incontinence
 - d. Persistent gastrointestinal symptoms: crampy abdominal pain, vomiting
3. **Reduced blood pressure** after exposure to a known allergen for that patient (minutes to several hours):
 - a. Adults: SBP < 90 mmHg or > 30% decrease from baseline



Scenario 2

Fosaprepitant Reaction

M.S. is a 47-year-old patient with Laryngeal Carcinoma presenting for C1D1 Weekly Cisplatin Concurrent with RT.

This is the first time the patient has received chemotherapy.

Allergy: NKDA

ECOG: 0



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Scenario 2 Contd.

Review of Systems:

General: Alert, oriented times x 3, in no apparent distress.

Skin: warm, dry, intact, no lesions

HEENT: normocephalic, atraumatic.

Cardiovascular: Regular rate and rhythm; normal S1, S2. No S3, S4, no murmur

Respiratory: anterior/posterior lung sounds clear to auscultation bilaterally, no adventitious lung sounds

Abdomen: normal bowel sounds; abdomen soft, nontender, non-distended. No abnormal masses are palpable.

Musculoskeletal/Extremities: No peripheral edema

Neurological: no focal neurological deficits; speech normal; sensation grossly intact

Vital Signs:

BP	125/76
Heart Rate	65
Resp	16
Temp	98.5 °F Oral
SpO2	97 %
Weight	92.5 kg (204 lb 0.6 oz)
Height	5' 10.87" (1.8 m)
Pain Score	0

Scenario 2 Contd.

Laboratory Data:

WBC	7.1
RBC	5.22
HGB	14.1
HCT	43.6
PLT	300
Absolute Neutrophils	5.3
Absolute Lymphocytes	1.1
Absolute Eosinophils	0.1
Absolute Basophils	0.1

Glucose	120↑
Sodium	138
Potassium	4.7
Chloride	103
BUN	15
Creatinine	1.21↑
Calcium	8.8
Protein, Total	6.8
Albumin	3.4↓
GOT/AST	16
GPT/ALT	21
Alkaline Phosphatase	111
Bilirubin, Total	0.6



Scenario 2 Contd.

Medication

Premedication

- Dexamethasone 12 mg + Ondansetron 16 mg IVPB over 15 minutes
 - Given: 1046-1101
- Fosaprepitant 150 mg IVPB over 20 minutes
 - Started at 1105

At 1110, the patient started complaining of feeling flushed, nausea, and back pain.



Scenario 2 Contd.

Next Steps?

Scenario 2 Contd.

Vital Signs @ 1111

BP	180/100
Heart Rate	97
Resp	20
SpO2	96 %

Based on the assessment and vitals, what medications and/or supportive care would you administer to the patient?



Scenario 2 Contd.

Vital Signs Over the Next 10 Minutes:

Vital Signs @ 1113

BP	138/82
Heart Rate	95
Resp	18
SpO2	96 %

Vital Signs @ 1118

BP	126/69
Heart Rate	94
Resp	16
SpO2	96 %

Vital Signs @ 1123

BP	127/78
Heart Rate	66
Resp	18
SpO2	97 %



Scenario Debrief

- This patient a severe reaction but was not anaphylactic.
- This required additional supportive medications apart from diphenhydramine, but not necessarily the use of epinephrine.
 - However, if symptoms worsen instead of improving, or if patient does not seem to improve at all after about 20 minutes of monitoring, epinephrine should be considered for severe reactions.
- Severe reactions typically include CV, respiratory, or GI involvement (Dyspnea, stridor, wheeze, N/V, diaphoresis, chest or throat tightness, abdominal or back pain). Patients may also be experiencing cutaneous or subcutaneous symptoms (generalized erythema, periorbital edema, urticaria, angioedema) as well.

Scenario Debrief Contd.

- Patients should receive diphenhydramine 50 mg IV, as well as other supportive care based on symptoms.
 - Albuterol inhaler 2 puff – for wheezing, cough, SOB
 - Morphine 2mg IV for rigors
 - Famotidine 20 mg IV for abdominal or chest pain from reflux
 - Methylprednisolone 125 mg – helps to prevent biphasic reactions from occurring.
 - Liter bolus of NS
 - Oxygen via nasal cannula titrated to keep SpO2 above 92%
- Premedication with fosaprepitant: serious reactions, including anaphylaxis, have been reported with fosaprepitant and are thought to be related to the vehicle polysorbate 80. Do not resume use if symptoms occur with first-time administration.





**What to do moving forward
after a reaction?**

Questions?

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Joint Accreditation Criteria requires that the provider gathers data or information and conducts a program-based analysis on the degree to which its CE mission—as it relates to changes in skills/strategy, or performance of the healthcare team, and/or patient outcomes—has been met through the conduct of CE activities/educational interventions. [Joint Accreditation Criteria](#)

- *IPCE Mission Statement: To foster collaborative healthcare practice through evidence-based education designed to enhance our individual interprofessional team members' and our healthcare teams' competence and performance, to ultimately contribute to the optimization of patient outcomes and the promotion of high value care so we can help people live well."*
- *A quarterly survey will be emailed to those who attended this Series to contribute their feedback to help organizers prepare for the next program year. You will receive a link to the Series evaluation from CME@aah.org. YOUR FEEDBACK IS VITAL TO OUR SUCCESS!*

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