UW Radiology Prophylaxis Guidelines for Hypersensitivity Reactions to Contrast Media

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Background

Intravenous (IV) contrast media are widely used in diagnostic imaging, most commonly in computed tomography (CT) with iodinated contrast media (ICM). Prior to the COVID-19 pandemic, approximately 80 million CT examinations were performed annually in the United States, with an estimated 35–40% utilizing IV iodinated contrast. This number continues to rise precipitously.

According to the 2025 ACR–AAAAI Joint Consensus Statement, the overall incidence of immediate hypersensitivity reactions to modern low-osmolality ICM (LOCM) is approximately 0.2–0.7%, with severe reactions (including anaphylaxis) occurring in approximately 0.005–0.06% of administrations. LOCM (e.g., iohexol), introduced into routine practice after 1985, remain the standard-of-care agents for IV iodinated contrast.

For gadolinium-based contrast agents (GBCA), hypersensitivity reactions occur less frequently, with aggregate rates of approximately 0.004-0.7% and severe reactions reported in 0.001–0.01% of administrations. Adverse reactions to ultrasound microbubble contrast agents are similarly uncommon, with recent data demonstrating severe reaction rates of approximately 0.01%.

For both ICM and GBCA non-allergic reactions, including physiologic reactions such as coldness, warmth, injection site pain, self limited nausea/vomiting, and dizziness are also quite rare with incidence of such reactions reported as high as 3-5%. These are self-limited reactions that do not require special prophylactic accommodation or preclude future contrast administration.

Clear institutional guidance on the management of contrast media reactions is essential. The purpose of this guideline is to provide evidence-based recommendations regarding risk stratification and premedication strategies for patients with a history of prior contrast reactions. These updated UW guidelines align with the 2025 ACR–AAAAI Joint Consensus Statement and emphasize individualized risk assessment, preferential use of contrast substitution (“contrast swapping”) when feasible, and judicious use of corticosteroid prophylaxis.

Definitions

Adverse Reaction to Contrast Media – An umbrella term encompassing any untoward reaction occurring in temporal association with the administration of contrast media, regardless of route (intravenous, intra-arterial, oral, rectal, or intraluminal). These reactions result from unintended effects related to the inherent pharmacologic or physicochemical properties of the agent. Adverse reactions are categorized by timing as follows:

- **Immediate reactions:** Occur within 1 hour of contrast administration.
- **Delayed reactions:** Occur more than 1 hour after administration.

Non-Allergic Reaction – Also referred to as a physiologic reaction, this category reflects effects attributable to the agent's molecular characteristics, including chemotoxicity, osmotoxicity, or direct molecular interactions with endogenous pathways. These reactions are not IgE-mediated and do not represent true hypersensitivity. Accordingly, they should not be classified or documented as a contrast "allergy" in the medical record, as such labeling may create unnecessary downstream communication barriers and workflow inefficiencies.

Non-allergic reactions do not require corticosteroid premedication or contrast substitution. They may be stratified by severity (mild, moderate, or severe) according to the following criteria:

Severity	Non-Allergic Reactions - Signs and Symptoms
Mild	Isolated nausea or vomiting Transient flushing, warmth or chills Headache Dizziness Anxiety Altered taste Mild hypertension Vasovagal reaction that resolves spontaneously
Moderate	Protracted but isolated nausea or vomiting Hypertensive urgency Isolated chest pain Vasovagal reactions that require and are responsive to treatment
Severe	Arrhythmias Convulsions or seizures Hypertensive emergencies Vasovagal reaction resistant to treatment

Immediate Hypersensitivity Reaction – Hypersensitivity reactions (HSR) are immune-mediated adverse events that may occur either **immediately (within 1 hour of administration)** or in delayed fashion (more than 1 hour after administration). These were previously termed "allergic-like" or "anaphylactoid" reactions to contrast media. In some cases, it may be clinically difficult to distinguish a true immune-mediated HSR from a non-allergic (physiologic) reaction. When

uncertainty exists, the reaction should be managed as a hypersensitivity reaction rather than as a non-allergic reaction.

Immediate HSR and non-allergic reactions are the most relevant adverse reactions in routine radiology workflows. The pathogenesis of immediate HSR to contrast media remains incompletely understood and is likely heterogeneous. In many patients, reactions are non–IgE-mediated. However, true IgE-mediated reactions can occur. Non–IgE-mediated reactions are hypothesized to result from direct mast cell and basophil mediator release through nonspecific receptor interactions, osmotic effects of contrast media, or activation of complement and kinin pathways. In contrast, IgE-mediated reactions involve antigen-specific immune mechanisms and are more likely to demonstrate positive allergy skin testing (ST), particularly in cases of severe immediate HSR.

Immediate HSR may be stratified by severity (mild, moderate, or severe) according to the following criteria:

Severity	**Hypersensitivity Reactions - Signs and Symptoms**
Mild	Localized itching or hives (less than 50% body surface area) Itchy or scratchy throat Nasal congestion, sneezing, redness around eyes, runny nose
Moderate	Diffuse hives (rapidly spreading or greater than 50% body surface area) Facial angioedema, throat tightness/hoarseness **without** stridor Wheezing, bronchospasm **without** hypoxia
Severe	Reaction involving 2 or more moderate symptoms Anaphylaxis (definition below) Facial angioedema with shortness of breath Throat tightness/hoarseness with stridor (laryngeal edema) Wheezing, bronchospasm with hypoxia Low blood pressure

Anaphylaxis – Anaphylaxis to contrast media should be considered likely when acute onset of illness occurs ***within minutes*** after administration without other known allergens/triggers and ***2 or more*** of the following criteria are met:

- Involvement of skin, mucosal tissue or both
- Respiratory compromise
- Reduced blood pressure or assisted symptoms of end-organ dysfunction **
- Significant/persistent vomiting and/or severe diarrhea (significantly more severe than a typical quickly resolving emesis that can be seen as a side effect)

** Severe hypotension may preclude any other manifestations of anaphylaxis. If present, it should be considered if there is no source of acute onset severe hypotension within minutes of IV contrast media administration

Delayed Hypersensitivity Reaction – HSRs with symptom onset **more than 1 hour after** contrast administration are classified as delayed hypersensitivity reactions. Establishing causality may be challenging, as symptom onset can occur days to weeks following exposure.

Delayed HSR are generally less common than immediate reactions, though reported incidence varies widely in the literature, ranging from approximately 0.5% to 23% of all ICM adverse reactions, depending on study design and ascertainment methodology.

The pathophysiology of delayed HSR is believed to be T cell–mediated. Skin biopsy specimens frequently demonstrate perivascular infiltration of CD4+ and CD8+ T lymphocytes, supporting a type IV (delayed-type) hypersensitivity mechanism.

Clinically, delayed HSR most often manifest as isolated cutaneous reactions. In one large study from South Korea, 99% of delayed HSR presented solely with skin findings, with 88% characterized as maculopapular exanthems.

There is no indication to extend post-procedure monitoring beyond routine institutional protocols for patients with a prior delayed HSR undergoing subsequent contrast administration.

There is also no high-quality evidence supporting corticosteroid premedication to prevent recurrent delayed HSR. Patients with a history of severe cutaneous delayed HSR should avoid re-exposure to the implicated contrast agent. For patients with non-severe cutaneous delayed HSR, shared decision-making is recommended when contrast administration is clinically necessary, with consideration of contrast substitution (“contrast swapping”) based on reaction history and diagnostic need.

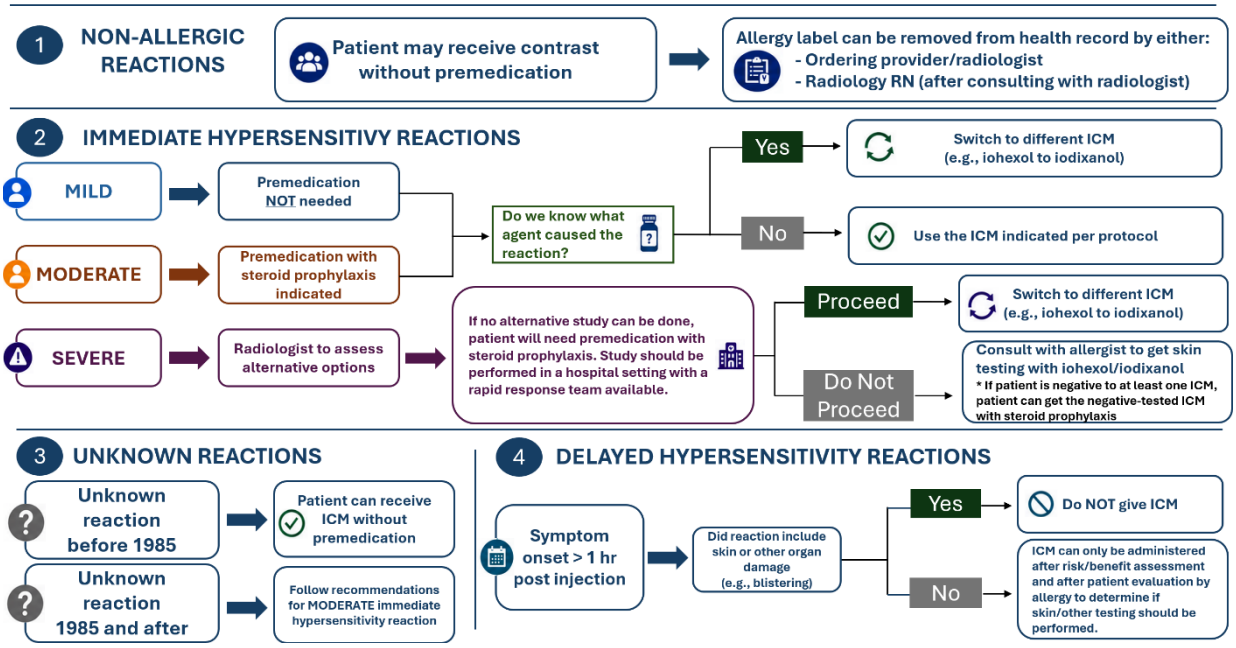
Contrast Swapping – The practice of switching to a different type of contrast agent for a given imaging modality. Examples include switching iohexol to iodixanol in CT and gadopiclenol to gadobenate in MRI. This technique is dependent on knowing the inciting agent, availability of alternative contrast agents, contrast function (e.g., GBCA hepatic uptake and biliary excretion for a specific indication), or other institutional constraints.

Contrast Prophylaxis Guidelines

What type of adverse contrast reaction happened before?

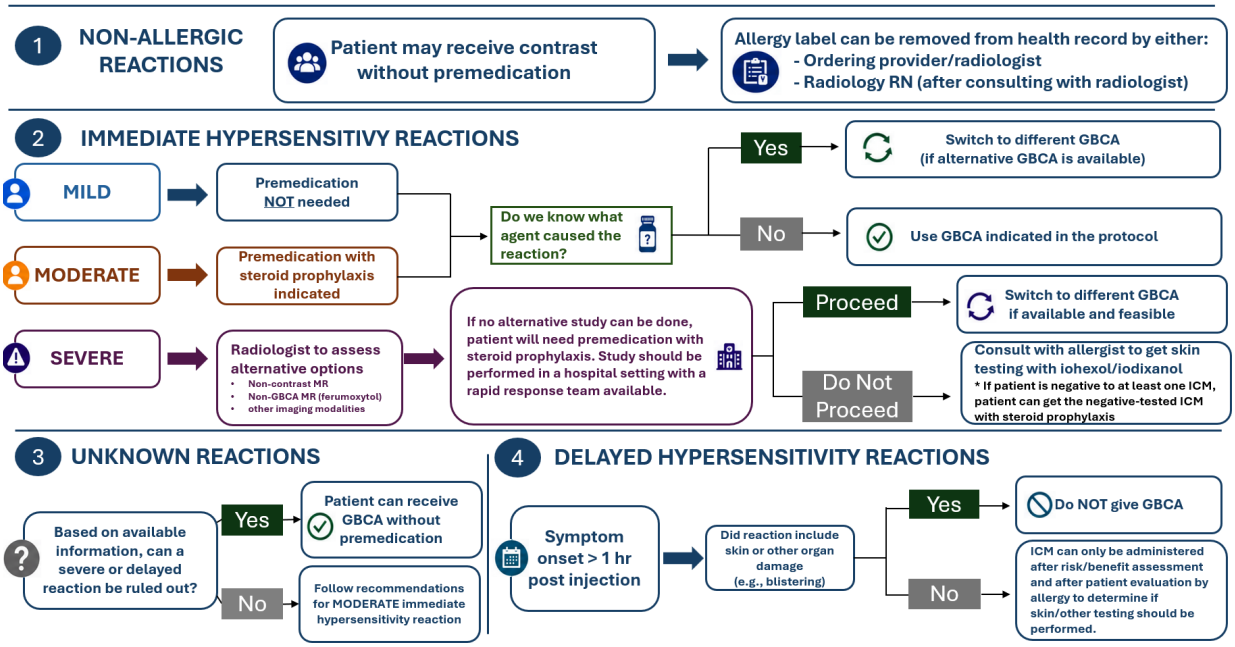
Non-allergic Reaction	**No prophylaxis required**
Immediate Hypersensitivity Reaction	**Prophylaxis contingent upon severity of reaction** (See Algorithm for next steps)
Unknown Reaction	**Prophylaxis contingent upon date of reaction and type of contrast used** (See Algorithm for next steps)
Delayed Hypersensitivity Reaction	**Reactions that occur 1 hour or later post injection. Prophylaxis and performance of CT contingent on reaction details.** (See Algorithm for next steps)

CT Iodinated Contrast Media (ICM) Prophylaxis Algorithm



A text description of CT Iodinated Contrast Media (ICM) Prophylaxis Algorithm is available on the UW Department of Radiology's website under Contrast Reactions and Pre-Medication.

MR Gadolinium Based Contrast Agent (GBCA) Prophylaxis Algorithm



A text description of the MR Gadolinium Based Contrast Agent (GBCA) Prophylaxis Algorithm is available on the UW Department of Radiology's website under Contrast Reactions and Pre-Medication.

The algorithms above should be used as a guideline when deciding whether to premedicate or use contrast swapping for a given adverse reaction to contrast.

- **Non-allergic reactions** do not require any form of prophylaxis. It is important that the word "allergy" is dissociated from such reactions and otherwise clarified as non-allergic reactions in the patient chart.
- **Immediate hypersensitivity reactions** should be further classified as mild, moderate, or severe and follow the guidelines above. For mild reactions, no corticosteroid prophylaxis is needed.
- **Delayed hypersensitivity reactions** should be assessed for any history of cutaneous manifestations. There is no evidence to support corticosteroid prophylaxis in this patient population.
- **Unknown hypersensitivity reactions** should be classified by time if possible. Those reactions that happened prior to 1985 do not need any corticosteroid prophylaxis.

There is **no routine need to observe asymptomatic premedicated patients after their scan**. For patients who are premedicated for a known allergy and exhibit no symptoms during their contrast enhanced exam, they may be discharged immediately following the exam.

If a patient has a history of breakthrough reaction, there may still be an opportunity to administer IV contrast with the appropriate premedication and contrast swapping strategies. The decision should be made on a case-by-case basis.

- Technologists should attempt to answer these questions prior to reaching out to the radiologists

    - What type of breakthrough reaction did the patient have. What were the symptoms, specifically?
    - What type of contrast was used when the breakthrough reaction happened.
    - How long after contrast administration did the patient start to exhibit symptoms.
- Once these questions are answered, technologists should reach out to the radiologist to see if it's appropriate to continue with IV contrast.

Corticosteroid Prophylaxis Options

Order sets are available for adult and pediatric contrast prophylaxis in the inpatient and outpatient setting.

- Adults
    - OP – Intravenous Iodinated/Gadolinium, Contrast Prophylaxis – Adult – Supplemental [5093]
    - IP – Intravenous Iodinated/Gadolinium Contrast Prophylaxis – Adult – Supplemental [5046]
    - IP/ED- Radiology Rapid Contrast Reaction Prophylaxis - Adult - Supplemental [6458]
- Pediatrics
    - OP – Intravenous Iodinated/Gadolinium Contrast Prophylaxis – Pediatric – Supplemental [10882]
    - IP – Intravenous Iodinated/Gadolinium Contrast Prophylaxis – Pediatric – Supplemental [10884]
    - IP/ED – Rapid Contrast Reaction Prophylaxis – Pediatric – Supplemental [10886]

A commonly used routine adult prophylaxis regimen is:

- Methylprednisolone (Medrol), 32 mg by mouth at 12 and 2 hours before contrast injection.
- Diphenhydramine (Benadryl), 50 mg intramuscular or oral 1 hour before contrast injection.

The rapid contrast reaction prophylaxis order sets should only be used in a truly urgent situation after discussion between the requesting service and the corresponding radiology service. The requesting service *must place a note in the electronic medical record* outlining the necessity and urgency of a contrast enhanced examination via the rapid prophylaxis protocol.

Missed Corticosteroid Doses: Sometimes, patients undergoing premedication present for a contrast-enhanced scan without completing their premedication regimen. In such cases, there is no evidence base to guide decision-making, so management should be individualized. If premedication is being used, a guiding principle is to have a minimum of 4-5 hours of corticosteroid therapy prior to contrast medium exposure, with repeat doses every 4-8 hours. Diphenhydramine administration is optional. Please refer to the *Pre-Medication Guidance for Patients Receiving Chronic Corticosteroid Therapy* prepared by Pharmacy for more information. This is available at https://www.radiology.wisc.edu/referring-clinicians/contrast-reactions-and-pre-medication.

Premedication in Patients Undergoing Chronic Corticosteroid Therapy: In patients who have had a prior allergic-like reaction to contrast medium and who are also on chronic corticosteroid therapy, premedication dosing may be modified. In this circumstance, there is no evidence base to guide decision-making, so management should be individualized. If corticosteroid premedication is being used, a guiding principle is to reduce the dose of the chosen premedication dose regimen by an amount equivalent to the patient's chronic therapeutic corticosteroid dose. If the patient is on

simple replacement (not therapeutic) corticosteroids, the premedication dosing regimen may not need to be adjusted. Please refer to the *Pre-Medication Guidance for Patients Receiving Chronic Corticosteroid Therapy* prepared by Pharmacy for more information. This is available at https://www.radiology.wisc.edu/referring-clinicians/contrast-reactions-and-pre-medication.

Diphenhydramine (trade name Benadryl) is a first-generation antihistamine used in the treatment of immediate HSR to contrast media. It may reduce the frequency of urticaria, angioedema, and respiratory symptoms associated with a HSR.

- Diphenhydramine should be considered ancillary and supplemental alongside corticosteroid prophylaxis.
- Diphenhydramine should not replace either contrast swapping or corticosteroid prophylaxis when indicated.
- Patients should not be rescheduled because they did not take a diphenhydramine dose prior to contrast administration.
- If a patient is allergic to diphenhydramine in a situation where it is indicated, consider an alternate antihistamine without cross-reactivity or the antihistamine portion of the regimen can be dropped. Consult pharmacy as needed.

If the patient did take diphenhydramine prior to an exam follow these guidelines. Diphenhydramine can have sedative side effects. Therefore, it is not recommended patients drive or operative heavy machinery 4-6 hours after a diphenhydramine dose. For a patient that does not have a driver.

- Educate patient that diphenhydramine does not help prevent contrast reactions but instead helps with symptoms of hives if they were to develop. If patient has questions, contact radiologist to discuss with patient.
- Encourage patient to arrange for a driver if possible.
- If no driver is available, proceed with the contrast-enhanced exam without pre-exam diphenhydramine, ensuring that patient understands the radiologist may give diphenhydramine if a contrast reaction were to occur.

Additional Scenarios

Iodinated Oral Contrast – Approximately 1-2% of oral contrast could be absorbed systemically.

- If a patient is undergoing premedication for IV contrast already, you may proceed with using iodinated oral contrast.
- Otherwise, if only administering oral contrast, switch to dilute barium (on formulary) instead.
- If a patient cannot get dilute barium (e.g., suspicion for perforation or leak) and has a severe iodinated contrast allergy, premedicate patient for oral contrast if the exam must proceed.

Arthrograms – Hypersensitivity reactions are dose independent. Since arthrograms use a needle and cross the bloodstream, the same premedication strategy should be used for arthrograms as for IV contrast media.

Hysterosalpingogram – In patients with patent fallopian tubes, there is peritoneal spill of contrast during the exam. Intraperitoneal contrast is absorbed. Because of the dose intendency to hypersensitivity reactions, the same contrast premedication should be used for hysterosalpingogram as for IV contrast media.

CT peritoneography – Intraperitoneal contrast is absorbed. Because of the dose independency to hypersensitivity reactions, the same contrast premedication should be used for hysterosalpingogram as for IV contrast media.

Contrast Myths That Persist

The following scenarios commonly arise and ***do not require*** steroid prophylaxis or contrast swapping.

Non-Allergic Reactions – Patients that have exhibited prior non-allergic reactions.

Seafood/shellfish allergies – Seafood allergies are IgE-mediated reactions due to tropomyosin release in crustaceans-based foods. There is no cross-reactivity with contrast media.

"Iodine" allergy – Often patients may have a non-specific "iodine" allergy listed. We should stress that iodine is a naturally occurring element. Commercially available salt is fortified with iodine. Iodine is an essential element required to produce thyroid hormones that regulate metabolism. Often ***this allergy may refer to a topical povidone-iodine product used as an antiseptic agent***. Patients with a topical iodine allergy do not have cross reactivity with iodinated contrast media.

Prior delayed hypersensitivity reactions – Patients with prior delayed hypersensitivity reactions (reaction onset > 1 hour from administration) do not need premedication. Please follow the rubric above as to whether one should proceed to give contrast to these patients.

Prior gadolinium-based contrast agent (GBCA) hypersensitivity reaction – There is no cross reactivity between iodine and gadolinium containing contrast media. Therefore, a patient with a known CT iodinated contrast media allergy does not need prophylaxis for an MRI using a gadolinium-based contrast agent and vice versa.

Miscellaneous isolated histories – Isolated histories of asthma, alternative drug/food allergy, stinging insect allergy, family history of hypersensitivity reaction to contrast media, multiple myeloma, beta blocks, ACE inhibitors, a specific gender, or history of cardiovascular disease do not warrant contrast prophylaxis.

Appendix

Historical Context for Corticosteroid Prophylaxis – Historically, early investigations of corticosteroid prophylaxis were conducted in the era of high-osmolality contrast media (HOCM), which are no longer used intravenously in contemporary practice. The transition to universal use of low-osmolality contrast media (LOCM) has substantially reduced the baseline risk of immediate adverse reactions to iodinated contrast media (ICM).

There is no high-quality evidence demonstrating that corticosteroid premedication reliably prevents recurrent hypersensitivity reactions in patients receiving LOCM. Interpretation of the available data is further limited by heterogeneity in premedication regimens and the overall low incidence of severe reactions with modern agents.

Despite limited and unproven benefit, survey data from 2009 demonstrated increased radiologist support for corticosteroid premedication regimens compared with similar data from 1995.

Data Supporting Corticosteroid Premedication – Based on current evidence, corticosteroid prophylaxis is not recommended for patients with a history of mild immediate hypersensitivity reactions (HSR) to contrast media. However, the overall certainty of evidence is low, and future studies may refine this recommendation. In select cases—such as strong patient preference, heightened anxiety, or unique clinical circumstances—premedication may be considered after shared decision-making between the patient and the healthcare team.

A comprehensive analysis by the Joint Task Force on Practice Parameters did not demonstrate a statistically significant benefit of corticosteroid prophylaxis in preventing recurrent immediate HSR to contrast media (relative risk 1.07). Nevertheless, corticosteroid prophylaxis may be considered in patients with a history of moderate immediate HSR, with careful weighing of potential benefit against the risks, burdens, and logistical implications of premedication (e.g., treatment delays, steroid-related adverse effects). The supporting evidence remains low in quality and certainty. Given this uncertainty and the higher baseline risk of recurrence in this population, UW Radiology continues to recommend corticosteroid prophylaxis for patients with prior moderate immediate HSR.

For patients with a history of severe immediate HSR, corticosteroid prophylaxis is recommended when contrast-enhanced imaging is clinically necessary and no reasonable alternative study exists, or when the risks of delayed diagnosis outweigh the risks associated with premedication. It is important to emphasize that evidence supporting this approach remains of very low quality.

A frequently cited randomized trial from 1994 evaluated prophylaxis in patients receiving low-osmolality contrast media (LOCM), but the study was underpowered to assess prevention of severe immediate HSR specifically. The composite endpoint included immediate HSR, chemotoxic reactions, vasovagal events, and other adverse effects. Reductions were observed in mild and moderate reactions, but not in severe immediate HSR.

A pooled meta-analysis of five retrospective studies (including patients with prior moderate and severe reactions) reported that corticosteroid prophylaxis was associated with a reduced likelihood of recurrent HSR (odds ratio 0.09). However, significant methodological limitations were noted, including:

- Heterogeneity in prophylaxis protocols and treatment algorithms
- Inclusion of patients without clearly defined moderate or severe prior reactions
- Inclusion of patients with vague "allergic-like" histories, asthma, or unrelated allergies

Importantly, breakthrough reactions occurred in approximately 2.1% of premedicated patients, and nearly half of these required prompt medical intervention. Patients with a history of moderate or severe immediate HSR have reported recurrence rates of up to 12%, with higher recurrence risk observed in those with more severe prior reactions.

Risks of Corticosteroid Premedication – The direct pharmacologic risks of corticosteroid premedication are generally considered low but are not negligible. Reported effects include transient, typically asymptomatic hyperglycemia (often resolving within 48 hours), transient leukocytosis, insomnia, mood changes, and mild behavioral effects.

Historically, some premedication regimens also included diphenhydramine. Antihistamines carry anticholinergic and sedative effects, which may impair cognition, increase fall risk in vulnerable populations, and limit a patient's ability to drive or operate machinery following administration.

The indirect risks of premedication are often more clinically significant and relate primarily to diagnostic delay. Standard corticosteroid premedication regimens (e.g., 12–13 hour protocols) may postpone contrast-enhanced imaging, potentially delaying diagnosis and treatment. As a result, the routine use of premedication has become increasingly controversial.

Mervak et al. (2015) estimated that approximately 69 patients would need to receive corticosteroids to prevent one recurrent reaction of any severity, and 569 patients would need treatment to prevent one severe reaction.

Davenport et al. (2016) evaluated hospitalized patients who received a 13-hour corticosteroid premedication regimen (n=1,424) prior to contrast-enhanced CT and compared them with a matched control cohort (n=1,425) adjusted for 13 comorbid conditions. The premedicated group demonstrated:

- A longer median time to CT (42 vs 17 hours)
- A longer median hospital length of stay (158 vs 133 hours)
- A higher incidence of healthcare-associated infections (5.1% vs 3.1%)

These findings highlight that while the pharmacologic risks of corticosteroids are modest, the system-level and patient-level consequences of delayed imaging may be clinically meaningful and should be incorporated into individualized risk–benefit discussions.

Evidence Behind Contrast Swapping – Current evidence suggests that **direct substitution ("contrast swapping") to an alternative iodinated contrast media (ICM) agent may be more effective than corticosteroid premedication alone** in preventing recurrent immediate hypersensitivity reactions (HSR).

In a study by Abe et al., the breakthrough reaction rate was 28% when the same ICM agent was re-administered without steroid premedication and 17% when the same agent was used with steroid premedication. In contrast, switching to an alternative low-osmolality contrast media (LOCM) without premedication was associated with a lower recurrence rate of 8%.

More compelling data come from McDonald et al., who retrospectively evaluated 1,973 patients with prior immediate HSR to ICM who subsequently underwent 4,360 contrast-enhanced CT examinations. Premedication alone was not associated with a meaningful reduction in breakthrough reactions (26% with steroid prophylaxis vs. 25% without). However, direct ICM substitution markedly reduced recurrence rates:

- 3% breakthrough rate with both contrast swapping and premedication
- 6% breakthrough rate with contrast swapping alone

Most recently, a systematic meta-analysis of six studies including 7,155 patients with prior immediate HSR to ICM demonstrated that contrast substitution reduced breakthrough reactions by approximately 61% compared with re-exposure to the same agent. Although substantial heterogeneity existed among included populations and study designs, the overall signal favored contrast swapping over premedication alone.

Mechanistically, this strategy is biologically plausible. Patients with positive skin testing to a culprit ICM agent frequently test negative to alternative agents, suggesting limited cross-reactivity. Based on these data, the Joint Consensus Task Force recommended contrast substitution for all severities of prior ICM hypersensitivity reactions.

It is important to note that the strongest evidence for contrast swapping derives from the CT literature and pertains to iodinated contrast media. The question of whether similar principles apply to gadolinium-based contrast agents (GBCA) used in MRI has only recently been studied. While data remain limited, emerging evidence suggests a similar pattern:

- **Ryoo et al., 2019 (n=185)**: Patients with prior mild immediate HSR to GBCA had an overall recurrence rate of 19.6%, reduced to 6.9% with GBCA substitution. Single-dose corticosteroid premedication did not significantly reduce recurrence, and adding premedication to contrast swapping conferred no additional benefit.
- **Walker et al., 2021 (n=26)**: Prospective single-center trial including patients with mild or moderate HSR to gadobutrol or gadoxetate. The breakthrough rate after GBCA substitution was 3.7%, with no significant difference between those who did and did not receive corticosteroid premedication.
- **Han et al., 2024 (n=1,042 reactions in 375 patients)**: GBCA substitution was associated with a significantly lower recurrence rate (adjusted odds ratio 0.35).

- **Grueber et al., 2021 (n=28)**: In patients with confirmed GBCA allergy, skin testing demonstrated that cross-reactivity among GBCA agents was uncommon, though not absent.

Collectively, available data—though still evolving—support contrast substitution as a preferred risk-mitigation strategy for both iodinated and gadolinium-based contrast agents, with corticosteroid prophylaxis playing a more limited and adjunctive role.

Anaphylaxis Versus Vasovagal Reactions – Some features of a vasovagal event may overlap with those of anaphylaxis. Those include pallor, weakness, nausea, vomiting, diaphoresis, nausea, vomiting, bradycardia, and hypotension. Vasovagal reactions can usually be distinguished from anaphylaxis by the absence of any skin manifestations like urticaria, angioedema, flushing, and pruritus. The following table summarizes the major differences between anaphylaxis and vasovagal reactions.

Presentation	Vasovagal	Anaphylaxis
Onset	Prompt	Within 15-30 min. More serious reactions have more rapid onset.
Level of alertness	Lightheaded, transient syncope	May lose consciousness. Ranges from alert to persistent loss of consciousness.
Respiratory	Slowed, not labored	Dyspnea, cough, rhinorrhea, chest constriction, wheezing, stridor
Skin	Pallor, diaphoresis, clammy	Pruritus, urticaria, or flushing (>90%), angioedema.
Gastrointestinal	Nausea, emesis	Nausea, emesis, cramps, diarrhea.
Cardiovascular	Hypotension and alertness improve when supine	Hypotension and persistent loss of consciousness.
Management	Supine with legs elevated, cold washcloth on face and reassurance. In severe cases intravenous fluids and oxygen may also be needed	Intramuscular epinephrine, supine with legs elevated, intravenous fluid, oxygen, and other measures as warranted.

The following table lists a differential diagnosis to anaphylaxis.

Differential Diagnosis	Distinguishing Features
Exacerbation of asthma	History of asthma
Exacerbation of chronic urticaria	History of chronic urticaria
Inducible laryngeal obstruction or vocal cord dysfunction	No associated cutaneous symptoms
Panic attack	No significant vital sign changes
Munchausen stridor	Factitious anaphylaxis, no significant vital sign changes
Cardiovascular	Chest pain with precordial radiation, diaphoresis, shortness of breath and absence of cutaneous symptoms
Cerebrovascular	Focal neurologic deficit
Flushing syndromes	Preexisting conditions (e.g., carcinoid syndrome, mastocytosis, pheochromocytoma)
Reaction to other recent medication or food ingestion	Temporal relationship to other medications or foods
Postural tachycardia syndrome	Postural tachycardia without orthostatic hypotension; no associated cutaneous symptoms; history of postural tachycardia syndrome

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