

### ***Indications for Premedication***

Given that premedication does not prevent all reactions, has not been confirmed to reduce the incidence of moderate or severe reactions or reaction-related deaths, has limited supporting efficacy in high-risk patients, and is accompanied by direct and indirect harms, the utility of premedication in high-risk patients is uncertain. Given the tradeoffs between what is known and not known with respect to the benefits and harms of premedication, premedication may be considered in the following settings and scenarios:

#### **12- or 13-hour oral premedication may be considered in the following settings:**

1. Outpatient with a prior allergic-like or unknown-type contrast reaction to the same class of contrast medium (e.g., iodinated – iodinated).
2. Emergency department patient or inpatient with a prior allergic-like or unknown-type contrast reaction to the same class of contrast medium (e.g., iodinated – iodinated) in whom the use of premedication is not anticipated to adversely delay care decisions or treatment.

#### **Accelerated IV premedication may be considered in the following settings:**

1. Outpatient with a prior allergic-like or unknown-type contrast reaction to the same class of contrast medium (e.g., iodinated – iodinated) who has arrived for a contrast-enhanced examination but has not been premedicated and whose examination cannot be easily rescheduled.
2. Emergency department patient or inpatient with a prior allergic-like or unknown-type contrast reaction to the same class of contrast medium (e.g., iodinated – iodinated) in whom the use of 12- or 13-hour premedication is anticipated to adversely delay care decisions or treatment.

In rare clinical situations, the urgency of a contrast-enhanced examination may outweigh the benefits of prophylaxis, regardless of duration, necessitating that contrast medium be administered to a high-risk patient in the absence of premedication. This determination is best made jointly by the radiology team, the referring service, and potentially the patient (if feasible). In such cases, a team of individuals skilled in resuscitation should be available during the injection to monitor for and appropriately manage any developing reaction.

Regardless of patient status, history of a prior severe contrast reaction is considered a relative contraindication to receiving the same class of contrast medium in the future. If the same class of contrast medium is necessary and there are no alternatives, premedication should be considered, if feasible.

Routine premedication or avoidance of contrast medium for other indications, such as allergic reactions to other substances (including shellfish or contrast media from another class [e.g., gadolinium-based – iodinated]), asthma, seasonal allergies, or multiple drug and food allergies is not recommended.

### ***Specific Recommended Premedication Regimens***

#### ***Elective Premedication (12- or 13-hour oral premedication)***

1. Prednisone-based: 50 mg prednisone by mouth at 13 hours, 7 hours, and 1 hour before contrast medium administration, plus 50 mg diphenhydramine intravenously, intramuscularly, or by mouth 1 hour before contrast medium administration [21].

***Or***

2. Methylprednisolone-based: 32 mg methylprednisolone by mouth 12 hours and 2 hours before contrast medium administration. 50 mg diphenhydramine may be added as in option 1 [37].

Although never formally compared, both regimens are considered similarly effective. The presence of diphenhydramine in regimen 1 and not in regimen 2 is historical and not evidence-based. Therefore,

diphenhydramine may be considered optional.

If a patient is unable to take oral medication, option 1 may be used substituting 200 mg hydrocortisone IV for each dose of oral prednisone [38]. If a patient is allergic to diphenhydramine in a situation where diphenhydramine would otherwise be considered, an alternate anti-histamine without cross-reactivity may be considered, or the anti-histamine portion of the regimen may be dropped.

#### *Accelerated IV Premedication (in decreasing order of desirability)*

1. Methylprednisolone sodium succinate (e.g., Solu-Medrol®) 40 mg IV or hydrocortisone sodium succinate (e.g., Solu-Cortef®) 200 mg IV immediately, and then every 4 hours until contrast medium administration, plus diphenhydramine 50 mg IV 1 hour before contrast medium administration. This regimen usually is 4-5 hours in duration.
2. Dexamethasone sodium sulfate (e.g., Decadron®) 7.5 mg IV immediately, and then every 4 hours until contrast medium administration, plus diphenhydramine 50 mg IV 1 hour before contrast medium administration. This regimen may be useful in patients with an allergy to methylprednisolone and is also usually 4-5 hours in duration.
3. Methylprednisolone sodium succinate (e.g., Solu-Medrol®) 40 mg IV or hydrocortisone sodium succinate (e.g., Solu-Cortef®) 200 mg IV, plus diphenhydramine 50 mg IV, each 1 hour before contrast medium administration. This regimen, and all other regimens with a duration less than 4-5 hours, has no evidence of efficacy. It may be considered in emergent situations when there are no alternatives.

**Note:** Premedication regimens less than 4-5 hours in duration (oral or IV) have not been shown to be effective. The accelerated 4-5-hour regimen listed as Accelerated IV option 1 is supported by a case series and by a retrospective cohort study with 828 subjects [38].

#### ***Missing One or More Doses of Premedication***

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. Generally speaking, 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.

#### ***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. Generally speaking, 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.

#### ***Changing Contrast Media Within the Same Class***

In patients with a prior allergic-like or unknown-type contrast reaction to a known contrast medium, changing contrast media within the same class (e.g., one iodinated medium for another) may help reduce the likelihood of a subsequent contrast reaction [39,40]. Some studies have shown that the effect size of switching contrast media actually may be greater than that of premedication alone, but combining premedication with a change in agent seems to have the greatest effect [39,40]. Unfortunately, many patients do not know which specific agent they have reacted to in the past; they simply remember they had a reaction. In the future, through improved electronic medical records, routine linking of reactions to specific contrast media is likely to add value. In the current state, investigating which agent was responsible for one or more prior reactions often is not possible.

#### ***Premedication Is Not a Panacea***

No premedication strategy is a substitute for pre-administration preparedness. Contrast reactions occur despite premedication

[32], and radiology teams must be prepared to treat breakthrough reactions when they occur. Patients should receive information concerning their risk of a reaction according to local policy and practice.

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