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## Are Radiologists Knowledgeable About the Management of Severe Contrast Material-Induced Allergic Reactions?

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### Introduction

Use of intravenous contrast material in clinical radiology is common. The incidence of severe allergic reaction to intravenous contrast material is 1 of every 1000 uses for high-osmolar media and 0.2 of every 1000 uses for low-osmolar media. The mortality rate is similar for both media types at about 1 for every 100,000 uses.<sup>[1]</sup> Radiologists are expected to manage this medical emergency. The authors of this article indicated that no study has previously evaluated the North American radiologist's knowledge of the management of severe contrast allergy. Therefore, they surveyed Canadian and academic US radiology departments to assess the radiologists' knowledge in this particular arena.

### Survey of Radiologists' Knowledge Regarding the Management of Severe Contrast Material-Induced Allergic Reactions

Lightfoot CB, Abraham RJ, Mammen T, Abdolell M, Kapur S, Abraham RJ

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### Summary

The authors conducted a telephone survey of 253 radiologists in Canada's 13 English-speaking and 13 US university-affiliated radiology departments (81% yield in a 30% target population) to gather information on the choice of initial medication, epinephrine dosage in particular, in the management of severe contrast material-induced allergic reactions. No radiologist gave the ideal response, defined as 0.01 mg per kg of body weight to a maximum of 0.5 mg of 1:1000 concentrated epinephrine injected intramuscularly in the lateral aspect of the thigh. However, 94% correctly chose epinephrine as the initial medication. Forty-one percent provided an acceptable route of administration, concentration, and dose (defined as 0.1-0.5 mg of 1:1000 concentrated epinephrine for subcutaneous and intramuscular injections, and 5 µg to 0.5 mg of 1:10,000 concentrated epinephrine for intravenous injections). However, 17% of radiologists provided an overdose, and only 11% had sufficient knowledge regarding the contents of their crash carts/drug kits. The authors concluded that radiologists' knowledge of the use of epinephrine in the management of severe contrast material-induced reactions is deficient.

### Viewpoint

The findings of this study are sobering and rather alarming. No radiologist gave the ideal response for the dosage and route of administration for epinephrine, although indeed 94% of them named epinephrine correctly as the first-line drug for treatment. Other initial drugs that were named included an antihistamine (4%), steroid (2%), and others (2%). In addition, a majority of responses cited dosages or routes of administration for epinephrine that were not considered acceptable or gave overdoses that could cause other complications. Of note, although intramuscular injection is the preferred route of epinephrine administration, it was precisely the route most cited as inappropriate by the surveyed radiologists. Moreover, only 60% of radiologists were aware that 1:1000 concentrated epinephrine is supplied in 1-mL glass ampules, and 31% knew that the 1:10,000 concentration is supplied in 10-mL preloaded syringes. Although 56% of radiologists knew that epinephrine was kept in the computed tomography scanner room, only 11% were aware of the concentration of epinephrine that was available in their crash carts.

Despite the above finding that radiologists' knowledge of caring for patients with severe contrast agent-induced allergies is deficient, the authors argue that their **statistics may have been falsely elevated because many radiologists, apparently uncomfortable with the questions, withdrew from the survey.** A strength of this study is the method of survey. The surveys were conducted over the phone with on-the-spot questions, reducing the chance for referral to reference material. Rapid conclusion of the survey at each site (within 1 day) limited discussions among colleagues. The limitations of the study included the generalizability of the findings to community practices, pediatric imaging clinics, and other academic centers that were not included in the survey. Nevertheless, **the findings of this study reveal that the general knowledge of radiologists in the acute management of severe contrast agent allergic reactions is suboptimal.** In addition, the authors indicated that because of radiologists' general removal from regular patient care, they may be hesitant in delivering treatment and may choose to wait for acute care support staff to institute treatment. However, such delays may adversely affect patient outcome. Therefore, the authors suggest that **radiologists regularly educate themselves on this important topic and become familiar with the location and contents of the crash cart.** Moreover, placement of preloaded epinephrine autoinjectors in visible and easily reached locations where intravenous contrast materials are used can facilitate rapid delivery of appropriate treatment when needed.

## Abstract

## References

1. Idee JM, Pines E, Prigent P, Corot C. Allergy-like reactions to iodinated contrast agents. A critical analysis. *Fundam Clin Pharmacol.* 2005;19:263-281. [Abstract](#)

## Authors and Disclosures

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Disclosure: Hossein Jadvar, MD, PhD, MPH, MBA, has disclosed no relevant financial relationships.