

# Immediate reactions after mRNA SARS-CoV-2 vaccination

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## 1 Anaphylaxis after mRNA vaccination for SARS-CoV-2 is rare

Reported rates of anaphylaxis are 4.7 per million for the Pfizer-BioNTech vaccine and 2.5 per million for Moderna.<sup>1</sup> No fatal allergic reactions have been reported, possibly because of rapid identification and treatment.

## 2 An immediate reaction to the first dose of the mRNA vaccines should not preclude administration of the second dose

In a retrospective case series of 189 people who reported immediate reactions to the first vaccine dose, a second dose was successfully administered to 159.<sup>2</sup> Nonspecific and single-system reactions (e.g., flushing, hives, lightheadedness) to the first dose were more common than anaphylaxis,<sup>2</sup> and these can be mitigated by counselling and conservative treatment, including second-generation antihistamines.

## 3 Excipient skin testing is not useful<sup>3,4</sup>

In a case series of 80 people, 81% of whom had immediate-onset reactions to mRNA vaccines, 18% had positive skin tests to polyethylene glycol (PEG) or to polysorbate-80, which is structurally similar. However, 89% tolerated the second dose, including those with positive skin tests.<sup>4</sup> This argues against the presence of anti-PEG immunoglobulin (Ig) E antibodies.

## 4 Reactions to mRNA SARS-CoV-2 vaccines may not be mediated by IgE antibodies

The mechanism of mRNA vaccine reactions is unknown. Liposomes, like those in the mRNA vaccines, can trigger complement activation-related pseudoallergy, leading to mast cell degranulation. The same mechanism mediates reactions to other liposomal medications, such as liposomal doxorubicin. Pseudoallergy may explain why people with immediate reactions to their first dose are able to tolerate subsequent doses.<sup>5</sup>

## 5 Rapid allergist assessment for mRNA vaccine administration is now accessible across Canada

The National Advisory Committee on Immunizations recommends that people with suspected allergic reactions after a first dose of an mRNA vaccine can receive additional doses of any mRNA vaccine, in consultation with an allergist. Expedited allergist assessments can be conducted in person (<https://cirnetwork.ca/sic-network-patient-referrals/>) or via an electronic platform (<https://otnhub.ca>).

## References

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