

Local dermal reactions to Moderna COVID-19 vaccine

Minor local reactions (pain, erythema/redness, swelling/induration, and axillary swelling/redness) are the most common reactions experienced by individuals receiving the Moderna COVID-19 vaccine (Table 1). The frequency and severity of the local reactions are higher following the 2nd dose (compared to the first dose) and in individuals between the ages of 18 – 64 years (compared to older adults aged 65 and older).

These reactions tend to be self-limiting requiring only supportive care. The majority of these reactions are experienced on day 1 and tend to persist for 2 days following the first dose and 3 days following the second dose. However, 3.7% of vaccine recipients reported local reactions that persisted more than 7 days. In individuals aged 18 – 64 years, pain (1.5%) and axillary lymphadenopathy (2.5%) were more frequently reported to last more than 7 days while pain (1.2%) and erythema (0.7%) were more persistent in adults 65 years and older. An example of grade 3, persistent erythema and swelling/induration is depicted in Figure 1 and may be confused with cellulitis.

Table 1. Frequency of local reactions to the Moderna COVID-19 vaccine.

Reaction (any)	Dose 1		Dose 2		
	Moderna vaccine (%)	Placebo (%)	Moderna vaccine (%)	Placebo (%)	
Pain	18-64 years	86.9	19.1	90.1	18.8
	≥ 65 years	74.0	12.8	83.4	11.9
Redness/erythema	18-64 years	3.0	0.4	9.0	0.4
	≥ 65 years	2.3	0.5	7.4	0.4
Swelling/induration	18-64 years	6.7	0.3	12.6	0.3
	≥ 65 years	4.4	0.5	10.8	0.4
Axillary swelling/redness	18-64 years	11.6	5.0	16.0	4.3
	≥ 65 years	6.1	4.1	8.4	2.5

More severe local reactions (grade 3 or higher) have also been reported to occur following the Moderna COVID-19 vaccine (Table 2). These include pain requiring the use of prescription pain relievers or that prevented daily activity, swelling >100mm/>10cm, and any solicited local adverse reaction such as lymphadenopathy (localized axillary swelling or tenderness ipsilateral to the vaccination arm). Importantly, no grade 4 local reactions (e.g., necrosis/exfoliative dermatitis or reactions requiring an emergency room visit or hospitalization) were reported.

Table 2. Frequency of severe (grade 3) local reactions to the Moderna COVID-19 vaccine.

Reaction (any)		Dose 1		Dose 2	
		Moderna vaccine (%)	Placebo (%)	Moderna vaccine (%)	Placebo (%)
Pain	18-64 years	3.2	0.2	4.6	0.2
	≥ 65 years	1.3	0.9	2.7	0.5
Redness/erythema	18-64 years	0.3	<0.1	2.0	0.1
	≥ 65 years	0.2	<0.1	2.1	<0.1
Swelling/induration	18-64 years	0.5	<0.1	1.7	<0.1
	≥ 65 years	0.5	<0.1	1.9	0.2
Axillary swelling/redness	18-64 years	0.3	0.1	0.4	<0.1
	≥ 65 years	0.3	0.4	0.6	0.2

Figure 1. Example of persistent erythema, swelling, and induration that may be observed after Moderna COVID-19 vaccine administration.

Image courtesy of Dr. Kimberly Blumenthal, MD, MS; Massachusetts General Hospital COVID-19 Vaccine Allergy Taskforce



References

1. Local reactions, systemic reactions, adverse events, and serious adverse events: Moderna COVID-19 vaccine. Centers for Disease Control and Prevention. <https://www.cdc.gov/vaccines/covid-19/info-by-product/moderna/reactogenicity.html> Accessed January 15, 2021.
2. FDA briefing document: Moderna COVID-19 vaccine. Food and Drug Administration Vaccines and Related Biological Products Advisory Committee Meeting (December 17, 2020). <https://www.fda.gov/media/144434/download>. Accessed January 15, 2021.