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CLINICAL SUMMARY

RUBBER ACCELERATORS IN MEDICAL EXAMINATION AND SURGICAL GLOVES

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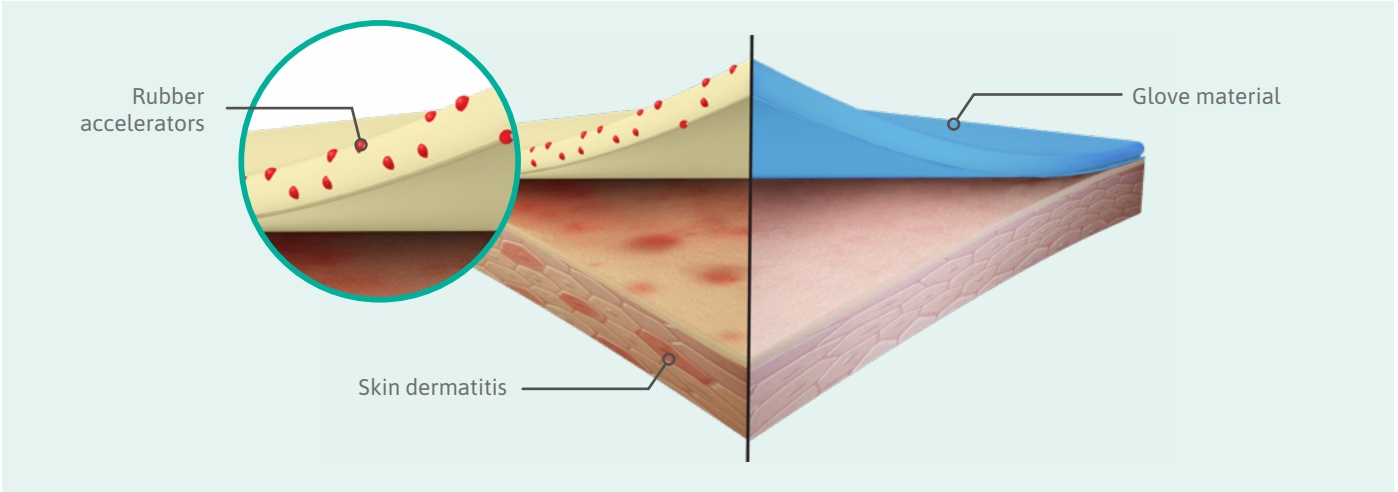
BACKGROUND



Allergic Contact Dermatitis (ACD) caused by rubber accelerators

Rubber accelerators are chemicals used to manufacture gloves and speed up the vulcanization process, with the accelerators working at different speeds. Vulcanization is a chemical process that crosslinks the rubber molecules, making the glove strong and elastic. However, due to frequent glove wearing, rubber accelerators are known to cause allergic contact dermatitis (ACD) among healthcare workers (HCWs). With up to 6.7% of medical professionals patch-test positive, it can be difficult to know which gloves would be a safer alternative to prevent sensitization and allergy, as manufacturers are not obligated to disclose which accelerators are used in their gloves.

There are five main families of accelerants used in manufacturing rubber gloves: **thiurams, dithiocarbamates, benzothiazoles, guanides, and thioureas**. These accelerators remain in the final glove product and may be released over time, causing sensitization and allergic contact dermatitis (ACD).

OBJECTIVES AND METHODS

This study aimed to identify the accelerators used in medical examination and surgical gloves distributed in the United States. The initial internet search was conducted to identify relevant manufacturers and product lines. Subsequently, each corresponding company was contacted to inquire about the accelerators used in their medical and surgical glove lines.

A two-step approach was used to identify the prevalence of six accelerators in medical gloves. First, the material safety data sheets (MSDSs) were reviewed on the company's website. If the MSDSs were unavailable, the manufacturers were contacted to inquire about the information.

RESULTS

Eleven glove manufacturers provided sufficient information to be included in the study. Of those, eight companies provided MSDS or written documentation regarding the accelerators used in their examination and surgical glove lines. Three companies stipulated that data could not be shared due to verbal agreement, proprietary information, or disclosed information regarding their accelerator-free glove offering. Due to the stipulations, 198 gloves were evaluated, but only 190 were published.

Of the 190 gloves in the final analysis, carbamates were reported to be the most common accelerator, found in 90.5% of the glove lines (172/190). Thiurams were present in two glove lines, totaling 5.8% of the accelerators studied (11/190). Thiurams, the most common rubber accelerator, cause a high incidence of sensitization and contact dermatitis. The analysis demonstrated a shift away from thiurams to carbamates in the production of medical gloves. Only 12 gloves were reported as accelerator free. Ansell was the only company in the study offering accelerator-free gloves for medical and surgical examinations.

Furthermore, the study's results demonstrated that a significant proportion of medical examination and surgical gloves contained one or more accelerators. This information was important for healthcare workers at risk of developing allergic contact dermatitis.

Breakdown of Individual Accelerators Used in Each Glove Category

Glove Category	Accelerator	Thiuram	Carbamates	Mercaptobenzothiazole	Mercapto mix	Dithiothiazoles	Diphenylguanidine	Black rubber
Nitrile Patient Exam, n (%)	N=68	0 (0.0)	57 (83.8)	3 (4.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Polychloroprene Patient Exam, n (%)	N=5	0 (0.0)	5 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Latex Patient Exam, n (%)	N=36	1 (2.8)	34 (94.4)	2 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Polyisoprene Surgical, n (%)	N=31	10 (32.3)	31 (100.0)	31 (100.0)	0 (0.0)	15 (48.4)	15 (48.4)	0 (0.0)
Polychloroprene Surgical, n (%)	N=9	0 (0.0)	4 (44.4)	0 (0.0)	0 (0.0)	2 (22.2)	3 (33.3)	0 (0.0)
Latex Surgical, n (%)	N=41	0 (0.0)	41 (100.0)	1 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

CONCLUSION

Rubber accelerators are a common component in medical examination and surgical gloves production. In this study, carbamates were present in almost all the gloves listed. Only 11 gloves used thiurams as the accelerant. These findings supported other studies that carbamates are being used more than thiurams in glove manufacturing. Healthcare workers are at a higher risk than the general population of developing allergic contact dermatitis to rubber accelerators, yet manufacturers are not readily forthcoming with the information about which accelerators are in their glove products. Gloves are also being manufactured, however, without chemical accelerators, providing a safer alternative.

APPLICATION FOR PRACTICE

1

Identify the cause of the allergic contact dermatitis

2

Choose a glove manufacturer who provides glove accelerator content

3

Choose a glove with non-sensitizing accelerators or accelerator-free

Note: This clinical summary is written by clinicians at Ansell Healthcare Products LLC. Please refer to the actual study for full text information.

Goodier MC, Ronkeinen SD, Hylwa SA, Rubber Accelerators in Medical Examination and Surgical Gloves, .Dermatitis, 2018;29 (2) : 66-76.

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