

Bacterial passage through punctures is correlated with the stiffness or elasticity of the glove material” Bardorf et al (2016).

Abstract:

Background: Medical examination gloves and surgical gloves protect the wearer directly and the patient indirectly from the risk of contamination. Because of concerns related to latex allergy, an increasing trend toward the use of synthetic gloves made of materials other than latex is observable. However, currently it is unknown if the physical properties of different materials may influence bacterial passage in case of a glove puncture.

Methods: We examined 9 different medical examination gloves from various manufacturers made of nitrile (n = 4), latex (n = 3), or neoprene (n = 2). Additionally, 1 latex surgical glove each with and without antibacterial chlorhexidine gluconate coating and 1 synthetic surgical glove made of thermoplastic elastomer were included in the experiments. The studied materials were perforated following a standardized procedure, and direct bacterial passage was measured under dynamic conditions. Glove elasticity at 1 cm up to 2.5 cm elongation was measured following EN 455-2.

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Results: Nitrile gloves demonstrated higher material stiffness compared with latex gloves. Medical examination gloves made of nitrile and neoprene showed a 10-fold higher bacterial passage through a standardized puncture compared with latex gloves. All surgical gloves showed a lower bacterial passage compared with the tested examination gloves.

Conclusion: Bacterial passage through punctures is correlated with the stiffness or elasticity of the glove material. Therefore, gloves made of latex may have an increased protective effect in case of a glove breach. Whenever gloves are purchased and selected, a risk-benefit assessment should be conducted, balancing the risk of allergy against the degree of required protection in case of a glove puncture.

Reference:

Bardorf, M.H., Jäger, B., Boeckmans, E., Kramer, A. and Assadian, O. (2016) Influence of material properties on gloves' bacterial barrier efficacy in the presence of microperforation. American Journal of Infection Control. July 4th. .

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