

The Evaluation of Contaminant Transfer from a “Used” Decontaminant

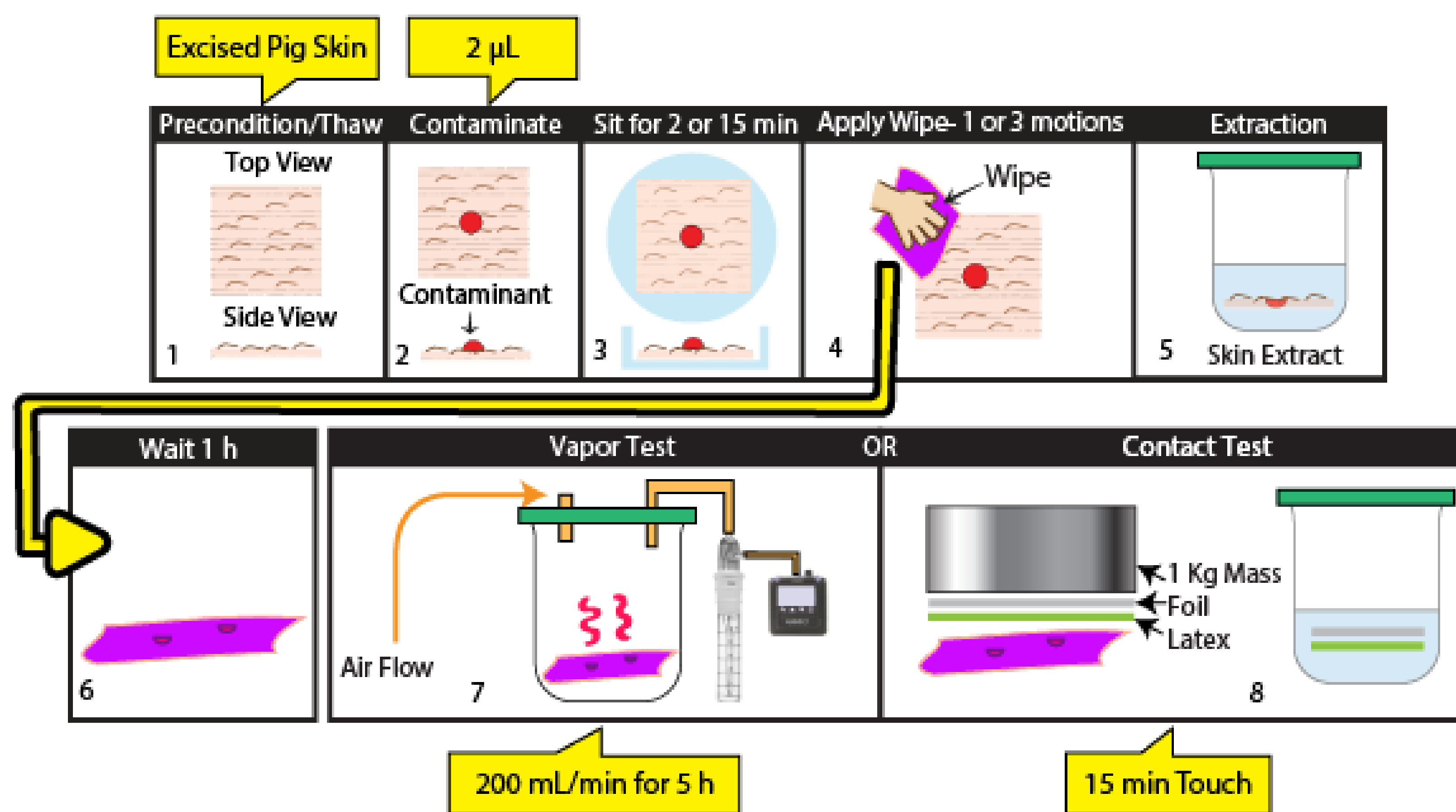
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Introduction

For personnel contaminated with toxic compounds, rapid skin decontamination is essential to reduce adverse health effects. After a product is used for decontamination, it is advantageous that the “used” product does not cross contaminate individuals or assets via vapor emission or contact transfer. This can be achieved via irreversible sorption or neutralization of the compound in the decontamination product. If the neutralization of the toxic compound in a “used” product cannot be directly measured, we demonstrate indirect methods to evaluate the emission and contact transfer of compounds from three different “used” decontamination products with and without neutralizing components.

Materials and Procedures



A microfiber towel with no neutralizing chemistries and two wipe technologies containing similar neutralizing chemistries were evaluated. The products were used against two different toxic compounds. After use, the products sat for 1 h and were then evaluated for vapor emission or contact transfer of the compounds.

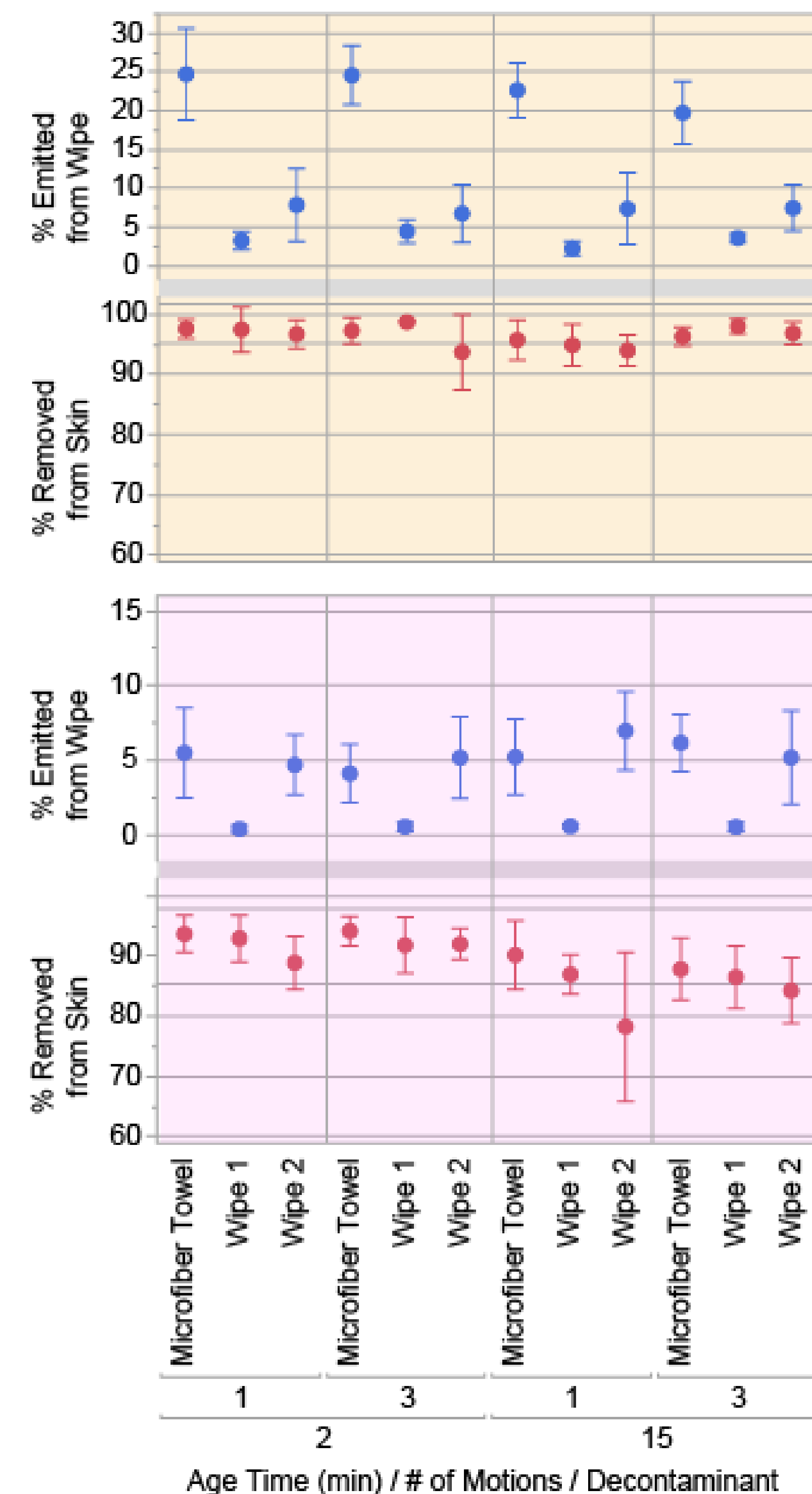


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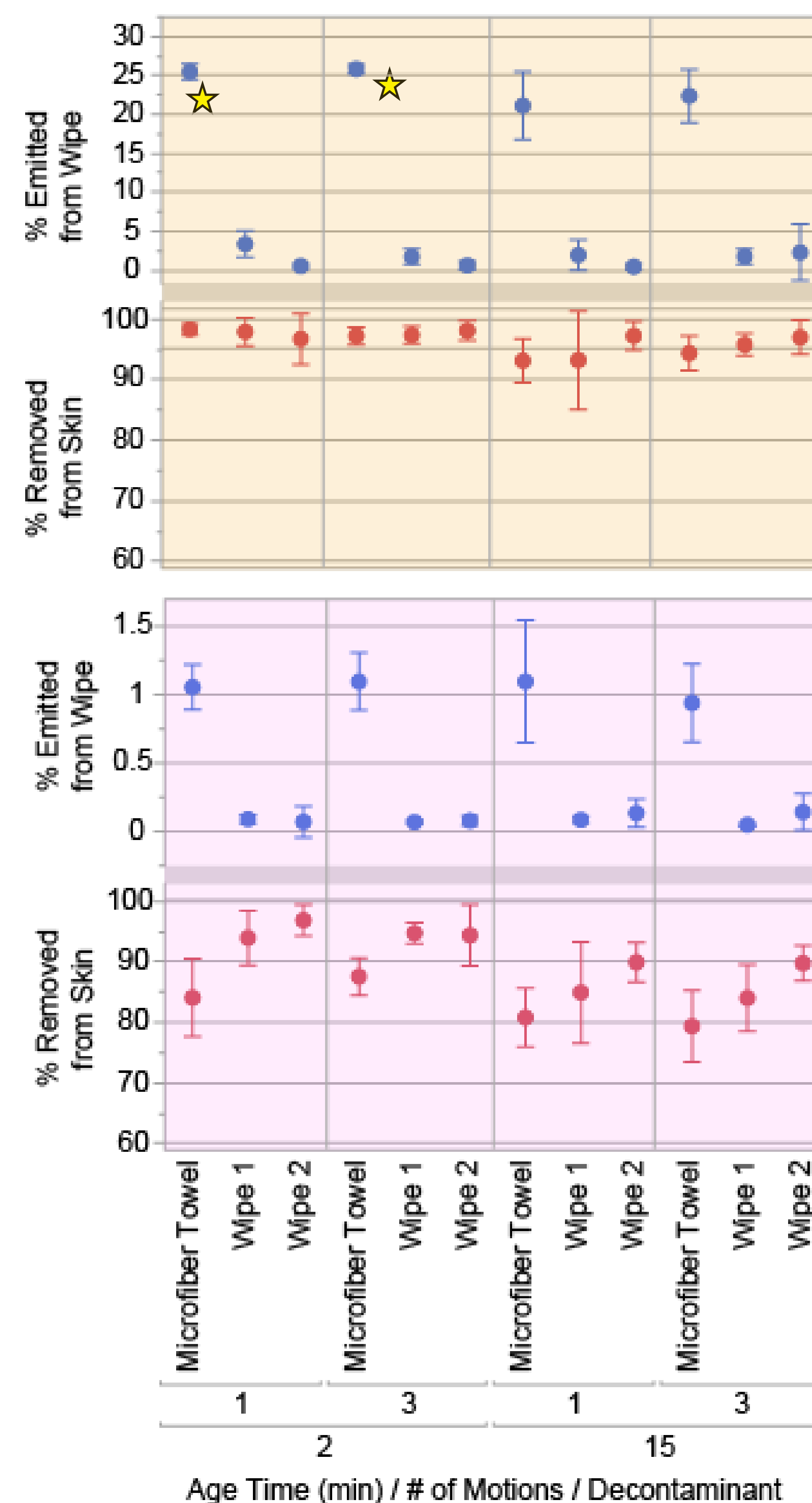
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Results

Contact Transfer



Vapor Emission



★ Samples exceeded the calibration of the analytical method; more analyte was present than measured. The results were presented using the highest measurable value for a sample (2,500 ng).

Discussion

Ideally, an effective decontamination product will strongly retain and neutralize a toxic compound. When neutralization cannot be directly determined, a measurement of contact transfer or vapor emission from the “used” product is useful. As percutaneous and inhalation are primary exposure routes of these toxic compounds, differences in transferred or emitted mass between products can indicate products that will limit secondary hazards to unprotected personnel.

For every condition evaluated, there were noticeable differences between the microfiber towel and the two wipe technologies for both emitted and transferred mass. The microfiber towel released more compound than the wipe technologies, despite removing similar amounts of the compound from the initially contaminated skin. The results suggest that the addition of the neutralizing chemistry reduces compound emission/transfer.

Additionally, differences in compound emission and transfer were observed between the two wipe technologies. Since both technologies contained similar active chemistries, these results suggest that the design of the wipe can impact successful decontamination. This data can influence potential configuration changes of a product to better retain and neutralize the compound. Transfer and emission data does not indicate if the compounds were neutralized but does provide information regarding the hazard that may be present to unprotected personnel and can inform handling guidelines for the used products.



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