

## Paper blades: Exploring the cutting properties of paper

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Paper cuts are a minor nuisance, but they can lead to life-threatening microbial infections. The physical processes that determine whether paper cuts into the skin, however, remain poorly understood. To explore skin-paper interactions, we designed an experiment in which a piece of paper contacts an artificial finger made from ballistic gelatin. Our experiments suggest that the paper thickness is one of the most important parameters in determining cutting efficacy. A relatively thin sheet often buckles before cutting is initiated, whereas the predominant interaction with thick sheets is indentation. Our preliminary data indicate that a successful paper cut is physically impossible outside a relatively narrow range of thicknesses for a given angle. Finally, the optimal paper cut is explored, and the design of an optimal paper-based scalpel is proposed and discussed. Authors Sif Fink Arnbjerg-Nielsen (presenter), Matthew Dominic Biviano, Kaare H. Jensen

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