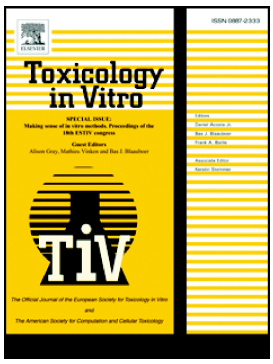

Assessment of test method variables for in vitro skin irritation testing of medical device extracts

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Assessment of test method variables for *in vitro* skin irritation testing of medical device extracts.

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Abstract

Skin irritation is an important component of the biological safety evaluation of medical devices. This testing has typically been performed using *in vivo* models. However, in an effort to reduce the need for *in vivo* testing, alternative methods for assessing skin irritation potential *in vitro* have been developed using a Reconstructed Human Epidermis (RhE) model. During the development of the protocol for round robin validation of *in vitro* irritation testing for medical device extracts, it became clear that there were three points in the procedure where different options may be validated within each laboratory for routine testing: sample exposure time (18 vs 24 hours), SDS positive control concentration, and cytokine (IL-1α) release testing. The goal of our study was to evaluate the effect of these variables. EpiDerm™ tissues were exposed to extracts of three plain polymer samples, and four polymers embedded with known irritant chemicals. Exposures were performed for 18 and 24 hours. Resulting tissue viability was assessed by MTT reduction and IL-1α release was assessed by ELISA. Testing was also performed using various concentrations of SDS ranging from 0.5 to 1% (w/v). Overall, results were similar for samples tested and 18 and 24 hours, but the 18 hour exposure time has the potential to have an impact on the results of some sample types. IL-1α testing was shown to be useful to clarify conflicting tissue viability results. Use of a lower concentration of SDS as a positive control can help prevent issues that arise from excessive tissue damage often caused by 1% SDS.

Key words: medical devices; irritation; alternative testing; in vitro; reconstructed human epidermis.

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1. Introduction

Skin irritation is an important component of the biological safety evaluation of medical devices. Irritation testing for medical devices has typically been performed using *in vivo* models (ISO, 2014). However, in an effort to reduce the need for *in vivo* testing, alternative methods for assessing skin irritation potential *in vitro* have been developed (Corp., 2014; Eskes et al., 2007; Portes et al., 2002; Spielmann et al., 2007).