

In Vitro Urethra Model to Characterize The Frictional Properties of Urinary Catheters - DTU Orbit (08/11/2017)

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Surface lubricity is one of the most important properties required for biomaterials or biomedical devices where tribological contacts with biological tissues are expected. While standard tribological techniques can provide sufficiently meaningful pre-clinical screening of their surface slipperiness, frictional properties of tubular devices such as catheters, endoscopes, and angioplasty balloons are particularly challenging to characterize because of non-standard shape and contact configuration. In this study, we propose that fabrication of in vitro urethra model with castable elastomers can provide conformal sliding contacts with the catheter and high relevance to clinical catheterization. With the proposed urethra model assembled in texture analyzer, the lubricity of catheters lubricated in different modes was tested. In comparison with conventional pin-on-disk tribometry, the coefficients of friction of sliding contacts with the urethra model with unlubricated and lubricated catheters were determined. Impact of the improved bio-relevance of friction testing methods on the evaluation of various catheter materials and surface modification methods is discussed in detail.

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