

**The present study represents a second step of the research activity and aims to investigate possible modifications of the PICC mechanical response, induced by long-term conservation in in vivo-like conditions, particularly when used to introduce oncologic drugs” Di Puccio et al (2017).**

Abstract:

INTRODUCTION: In a previous paper, the authors investigated the mechanical behavior of several commercial polyurethane peripherally inserted central venous catheters (PICCs) in their ‘brand new’ condition. The present study represents a second step of the research activity and aims to investigate possible modifications of the PICC mechanical response, induced by long-term conservation in in vivo-like conditions, particularly when used to introduce oncologic drugs.

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METHODS: Eight 5 Fr single-lumen catheters from as many different vendors, were examined. Several specimens were cut from each of them and kept in a bath at 37°C for 1, 2, 3 and 6 months. Two fluids were used to simulate in vivo-like conditions, i.e. ethanol and Ringer-lactate solutions, the first being chosen in order to reproduce a typical chemical environment of oncologic drugs. The test plan included swelling analyses, uniaxial tensile tests and dynamic mechanical thermal analysis (DMTA).

RESULTS AND CONCLUSIONS: All tested samples were chemically and mechanically stable in the studied conditions, as no significant weight variation was observed even after six months of immersion in ethanol solution. Uniaxial tensile tests confirmed such a response. For each PICC, very similar curves were obtained from samples tested after different immersion durations in the two fluid solutions, particularly for strains lower than 10%.

Reference:

Di Puccio, F., Gallone, G., Baù, A., Calabrò, E.M., Mainardi, S., Poli, P. and Scocca, A. (2017) Experimental investigation on the mechanical behavior of polyurethane PICCs after long-term conservation in in vivo-like conditions. August 24th. .

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