

Control of microbial contamination in drinking water from microfiltering dispensers by dialysis ultrafilters

Luca BOLELLI, Elida Nora FERRI, Stefano GIROTTI*

Department of Pharmacy and Biotechnology, University of Bologna, Via San Donato 15, 40127 Bologna, Italy

Abstract. Tap water filtering devices are widely employed to improve odor and taste of tap water, or to obtain refrigerated or sparkling drinking water. The presence of disinfectants-resistant bacteria in tap water is responsible of the biofilm formation inside tubes and tanks. The consequent contamination of dispensed water is a well-known hygiene problem because of the quite constant presence of potentially pathogenic bacteria likes *P. aeruginosa*. In this study, we tested the technical feasibility and effectiveness of the addition to different commercial devices of a packaged polysulphone fibers filter. We aimed to find a simple solution to implement the quality of the delivered water. Water contamination levels were determined in a wide selection of microfiltered water dispensers and we selected among them a representative group of 10 devices, new or in use. The packaged ultrafilter was introduced in about half of them, to monitor, when possible, in parallel the contamination levels and flow rate of a couple of identical units, with and without the filter. The placement of the dialysis filters resulted feasible at different positions along the water circuits of the variously designed filtration units. Delivered water resulted completely free from bacteria when the filter was placed exactly at, or very close to, the outlet in spite of the inner surfaces contamination. This performance was not obtained in presence of a more or less long tract of water circuits downstream the ultrafilter: a significant but not complete reduction of the plate count numbers was observed. The filters worked in continue over the whole study period, ten months, showing exactly the same efficiency. Moreover, the flow rate in presence of the filter was quite unaffected. The addition of this kind of filter to already in use water dispensers was technically easy, and its use can be recommended in all cases a simple but reliable water sanitization is requested.

Keywords: water microfiltration devices; drinking water quality; sterile dialysis filters; *P. aeruginosa*.

* Corresponding author e-mail: stefano.girotti@unibo.it