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Modelling urinary catheters with innovative approaches for patient's using QbD & 3D bioprinting

S P Yamini Kanti, Ildikó Csóka, Livia Adalbert, Orsolya Jójárt-Laczkovich

University of Szeged, Faculty of Pharmacy, Institute of Pharmaceutical Technology and Regulatory Affairs, Szeged, Hungary



Catheters have been widely used over forty years by patients who have been unable to empty their bladders in a natural way is to use Catheters. But, using catheters comes up with many complications such as painful and traumatizing process, causing injuries and can also cause different types of Urinary Tract Infections.

Based on the end -use, the market of catheters is classified as urinary incontinence & spinal cord injuries and based on the type of product, the market is classified into – Disposable and Reusable external catheters. In clinical practice, the occurrence of Bacterial Colonization, Antibiotic Resistance, Kidney and Bladder damage, Septicemia, Urethral trauma and other kinds of urinary Tract Infections have made it necessary to improve the quality and design of the Catheters for the end users.

Such incidents with all the understanding of the critical factors, addressing the expectations and needs of the patient's and users will determine the quality and the cost of the catheters. As Consumers & market behavior has changed during the COVID-19 pandemic, industries will have to restructure their strategies in order to comply with the changing market requirements. Applying new approaches such as Quality by Design and 3 D bioprinting will provide an efficient tool to integrate the driving elements such as quality, cost of the product and needs of the end-user, and hence facilitate the life cycle of product in line with the expectation of Pharmaceutical Industry-Regulatory and Consumer.