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Rahul R Panchal

Leonine Technologies Inc., USA

Self administrative drug delivery devices made with plastics material – market potential, customer discovery, challenges, manufacturing, and business model

Due to the increased health care costs, patients are looking for self-administration drug delivery devices where the drug can be packaged within the device. Because of this many pharmaceutical companies are moving towards drug and device combination for many drugs and reformulating their drugs so they can pack into the delivery device as a combination product like autoinjectors, infusion pumps, nebulizers etc. The delivery device is mainly made of injection molded plastics parts. The self-drug delivery systems have helped the patients a lot without relying on medical practitioners for drug delivery or taking frequent oral doses. However, pharmaceutical companies are still in denial to accept the importance of drug delivery devices as a part of their product portfolio, maybe they are worried about being subjected to medical device regulations which are not their core business. Hence, all major pharmaceutical companies rely on third-party device designers and manufacturers. In general, pharmaceutical companies select the device for a specific drug and conduct the patient survey by showing the device prototype via focus groups or patient experience studies. The risk behind this approach is that the patient creates own bias immediately after looking at the prototype and over 50% of patients do not provide honest feedback. Hence, the majority of patients requirements are not being translated to the device design. Any device failure will lead to patient complaints towards the pharmaceutical company even though the company is making the best drug ever available in the market. Another issue, majority of device developers are mechanical designers with little or no knowledge of plastics product design and manufacturing thus they fail in differentiating between plastics and non-plastics (metal) design concepts. Because of this, the majority of the device available in the market are designed having components with complex features not suitable for plastics materials or with the wrong material selection. This has resulted over a 30% increase in manufacturing cost and time. Therefore, it is very important to understand the importance of customer feedback even before starting the device design as well the science behind plastics product design and manufacturing, related technological innovations.

Biography

Rahul R. Panchal has completed his M.S. (2005) and PhD (2009) in plastics Engineering and Polymer Science from University of Massachusetts, Lowell. He has B.S. in Mechanical Engineering from Gujarat University, India (1998). He has extensive background and expertise in medical device design & manufacturing, polymer injection molding, statistics, multivariate analysis, in-mold sensing technology etc. He is an inventor of the patented in-mold sensor having the capability to measure in-mold shrinkage realtime. He currently works at AbbVie as a Principle Scientist Engineering, Combination Products and transitioning into entrepreneurship. He is also founder and president of Leonine Technologies Inc. which mainly focused on new technology development for injection molding, medical device, as well as training and consultation.

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