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**A Study on the Injection of Drugs for Anaesthesia Using Biophysical and Computational Analysis** JEHUN SHIN, SIEUN LEE, SEUNGHYUN KIM, Choice Research Group — Biomedical engineering in dental or epidural anaesthesia research requires a combination of all physical and numerical calculations and simulations. Although a finer needle used in modern medicine makes the injection easier and less painful, this type of needle requires a higher force to deliver the drugs at a given rate due to its smaller bore. In this research, factors such as dynamic viscosity of drugs, pressure changes along a tube, and flow rate are considered to model the syringing environment. In addition to these factors, the paper also addresses the dimensions of the syringe tube and the size of the needle for a given injection. In general, while using a small and short needle is safe, it is important to carefully consider the appropriate size of the needle and syringe for each type of medication that is delivered through the injection. Throughout this paper, numerical calculations and fluid dynamics are used in modeling the realities of injection performance. If the results are applied properly, the presented numerical and computational modeling can enable better and earlier decisions to be taken in the syringe injections. The decisions can not only reduce risk, but also support device designs that health care professionals can use more effectively.

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