

Desain dan Analisis Pengembangan Ketajaman Needle Lancet Point pada Single Use Hypodermic Needle Untuk Meminimalisir Trauma pada Jaringan Kulit Manusia = Design and Analysis of Needle Lancet Point Sharpness Development for Minimizing Human Skin Tissue Trauma

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Abstrak

Jarum suntik merupakan alat kesehatan yang paling sering digunakan dalam berbagai tindakan medis. Riset ini dilakukan untuk mempelajari dan mengembangkan geometri serta ketajaman ujung jarum suntik yang mampu meminimalkan rasa sakit dan trauma pada jaringan kulit manusia dengan mengurangi gaya insersi dan defleksi jarum. Geometri ujung jarum yang paling umum ditemukan adalah Three Plane Needle : Lancet Point yang memiliki tiga bidang di ujungnya untuk menghasilkan lancet point yang tajam. Reverse engineering dilakukan dengan menambahkan dua bidang bevel tambahan dalam perancangan Five Plane Needle : Back Bevel dan Front Bevel. Prototipe Five Plane Needle : Back Bevel dan Front Bevel dibuat menggunakan proses grinding dengan CNC Milling FANUC Robodrill DiB Series 31i-B. Performa insersi masing-masing jarum suntik akan diuji menggunakan Tensilon®. Hasil pengujian berupa: gaya penyisipan dan defleksi jarum akan diteliti dan dibandingkan dengan Three Plane Needle : Lancet Point. Five Plane Needle : Back Bevel dan Front Bevel dapat mengurangi gaya penyisipan dan defleksi jarum dibandingkan dengan Three Plane Needle : Lancet Point.

..... Hypodermic needle is the most common medical device that often used for medical procedures. This research were conducted to study and develop needle tip geometry and sharpness which is able to minimize pain and trauma in human skin tissue by reducing insertion force and needle deflection. The most commonly found needle tip geometry is Three Plane Needle : Lancet Point which has three planes at the tip to generate a sharp lancet point. Reverse engineering was conducted by adding two additional bevel planes in designing of Five Plane Needle : Back Bevel and Front Bevel. Prototype of Five Plane Needle : Back Bevel and Front Bevel were fabricated using grinding processes by CNC Milling FANUC Robodrill -DiB Series 31i-B. The insertion performance of each will be tested using Tensilon®. The result : insertion force and needle deflection will be investigated and compared to Three Plane Needle : Lancet Point. Five Plane Needle : Back Bevel and Front Bevel could reduce insertion force and needle deflection compared to Three Plane Needle : Lancet Point.