Reciprocating Procedure Syringes

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Technology description

Background

Syringes are an essential element in the day to day practice of medicine and nursing, but are also essential in industry, laboratory science, research, and animal husbandry. Syringes are used to inject medications, to aspirate body fluids, to provide vacuum, and to transfer fluids. The syringe design most commonly used in medicine consists of a barrel made of plastic and an internal plunger which is moved into or out of the barrel, resulting in pressure or a vacuum, respectively. Injection with a standard syringe is simple, and uses the powerful flexor muscles of the hand and forearm; however, aspiration with a standard syringe usually requires the use of two hands in order to generate the necessary power and maintain fine control. Many complicated medical procedures can benefit from the ability to use a syringe with one hand so that the other hand can be used for other tasks; yet, aspiration with a standard syringe is difficult and awkward using one hand, resulting in loss of fine motor control and power during aspiration. A new design of syringe that permits both injection and aspiration with one hand, yet maintains fine motor control and the strength necessary to generate high pressures and vacuums would be a major advance in syringe technology.

Technology Description

Researchers at the University of New Mexico have developed a reciprocating thumb-operated, double-plunger syringe that can be used in connection with existing syringe barrels and fittings. This novel invention provides a syringe that permits injection and aspiration of fluids or gas using one hand, and can be used in all cases where standard syringes are used. The resulting syringe is highly stable since only the thumb position changes, and very powerful vacuums or pressures can be developed since the powerful flexors of the fingers, thumb, and forearm are used for both aspiration and injection.

Publications

Reduced Pain of Intraarticular Hyaluronate Injection with the Reciprocating Procedure Device
Patient Pain and Tissue Trauma During Syringe Procedures: A Randomized Controlled Trial
A Randomized Controlled Trial of the Reciprocating Procedure Device for Intraarticular Injection of Corticosteroid

Syringe Size: Does it Matter in Physician-Performed Procedures?
Physician Control of Needle and Syringe During Aspiration-Injection Procedures with the New Reciprocating Syringe
Control and Performance Characteristics of Eight Different Suction Biopsy Devices
Integration of Safety Technologies Into Rheumatology and Orthopedics Practices
Does ultrasound guidance improve the outcomes of arthrocentesis and corticosteroid injection of the knee?
A randomized, controlled trial of the reciprocating procedure device for local anesthesia
Integration of Patient Safety Technologies Into Sclerotherapy for Varicose Veins
New Device Technologies for Subcutaneous Fat Biopsy
Needle aspiration of peritonsillar abscess with the new safety technology: The reciprocating procedure device

Advantages

Allows for one hand syringe use
Highly stable
Maintains fine motor skills of user
Generates high pressure/ vacuum
Efficiency improvements to single barrel syringe alternatives
Can be used in all cases where standard syringes are used
Advantages in medical procedures when one-handed injection/aspiration is required

Institution

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