

A CRITICAL NATIONAL NEED

ROBOTIC REMOTE CONTROL MEDICAL INFUSION MAKING ON DEMAND.

--WHITE PAPER--

Presented by:

Ti Kao, B.S. & M.S. (M.S. From Pharmacy School, Univ. WI.)

History of the Infusion Industry:

The infusion industry was established in 1911 when Kausch invented dextrose injection. The dextrose infusion, which a patient needs to maintain water and calories through an infusion system, has been made by a few suppliers. They have their own secretes. They try to reduce the caramelization and the particulates matters in the heating process with an addition of strong acid to make the originally neutral solution into pH 4 before autoclaving. Therefore, after autoclaving, the final product becomes very acidic and causes pain to patients.

The infusion phlebitis, a problem characterized by the tenderness and erythema at the injection site, is responsible for hospital morbidity and is seen in hospitalized patients. These ill effects are commonly seen in hospitals.

Professor Turco, Ph.D. in his Parenteral journal, pointed out that heat sterilization is known to induce acidic breakdown products of dextrose. A study of buffered dextrose solution was infused as opposed to commercially available unbuffered preparations. This resulted in less phlebitis problems. These studies have been confirmed by others.

According to the USP, the dextrose injection is required to have a pH value of 3.2 to 6.5 and 5-Hydroxymethylfural and related substances to be of an "absorbance of no more than 0.25." These are the heat sterilization's side products

The Current Medical Facility's Intravenous Supplying System:

Patients are currently getting a complete nutrition fluid prepared in a place called IV RM to make IV (Intra Venous) and TPN (Total Parenteral Nutrition).

THE IV RM is a special place to prepare IV/TPN for use. A specially trained team works in the IV RM for 8 hour a day. Due to service hours being limited, the IV RM becomes a disaster place.

After witnessing the problems and dangers resulting from the use of conventional dextrose infusions, I started doing literature research attempting to solve the problems associated with conventional infusion making.

Critical Nation Needed, A Novel Method and Devices in Infusion and TPN:

I presented my ideas to teachers, friends, and scientists. Three of the scientists took a great interest in my invention, spending a lot of time and energy to support my ideas. They advised that I patent my product before doing anything else.

These scientists are:

1. Dr. J.L wood, Ph. D. , the acting Dean of Univ. TN's graduate school in Memphis TN.
2. Dr. and Prof. Iris Norstrand M.D. and Ph D, Brooklyn V A Medical Center.
3. Dr. A. F. Debons, Ph. D., also Brooklyn V A Medical Center.

I took their advice and decided to patent my product. The patents that were granted to me are US Pat. #4,906,103, #5,196,001, #5,941,867 and #6,267,753. My original two US patents are designed for use in under-developed countries. The other two patents are designed for using a robot to preparing Infusion/TPN On Demand.

Our robot's automation system will eliminate the need for trained technicians. As a result, the price of infusion/TPN generated from the robot will be much cheaper. In addition, our robot will be available 24/7, will prevent human error and malpractice, and create new jobs. It will also be environmentally friendly saving energy, eliminating waste and eliminating

the need for shipping or storage. With all these advantages, facilities and patients will greatly benefit from our service.

The Marketing Value of Infusion and TPN:

- Over \$1,873 million of infusion at 9.2% growth rate in USA
- Over \$2,662 million of TPN at 0.9% growth rate in USA.
- Over \$4,680 million of infusion at 9.5% growth rate world wide.

Prospective of Robotic Business:

We shall establish our service from the city to begin with. The number of beds in a facility will determine the number of robots in that facility. However, the facility's intensive care units, the ER and the pharmacy shall be equipped with the number of robots necessary.

We shall strictly follow USP ascetics regulation to run our robot and have a close relationship with FDA.

Ophthalmic Solution and Ointment:

The ophthalmic solution and ointment field is even more delicate than the infusion/TPN, because the eye is more delicate than the vein. The ophthalmic solution needs a buffering agent to reduce the patient's pain when administering the drug into the eyes.

Drugs for eye use are also very sensitive to heat sterilization. Usually, the eye drugs prescribed by practitioners such as plant alkaloids or cultivated antibiotics, are very sensitive to the pH value. When autoclaving those solutions they decompose and lose medicinal activity.

In addition, USP requires that ophthalmic ointment need to pass a metallic particulate test. In the past, there were many pharmacy stores faced with law suits from patients due to harmful effects caused by eye drugs. According to the *Remington's Practice of Pharmacy, 1961 Ed.*, a pharmacist was sued by a patient concerning a prescription of eye medicines. As a result, now there are no more eye drug making services in drug stores.

The Competition:

The infusion industry has only a few players in the US. They are Baxter's and Travenol. Our competitors have the capital to introduce new products and have a global presence. What they do not have is our patent which may have a great impact worldwide. When we receive funding to build our robot and our invention is being used, we will offer partnership to our competitors to speed up the distribution of our invention and grow.

I am grateful for having the opportunity to present this White Paper which I enjoyed writing. I thank all the judges for reading my TIP.

Respectfully,

Ti Kao

Ti_kao@yahoo.com

(718) 854-1965