

# Safety and Efficiency of the Needle-Free Insulin Jet

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*In May, 2003, the Atlantic Veterinary College presented a study that evaluated the safety and efficacy of the needle-free insulin jet for use on diabetic dogs and cats. To address this objective, the Atlantic Veterinary College took a five step approach. The conclusions of the study, as well highlights from each of the five steps, will be summarized in this clinical information document.*

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The needle-free insulin jet is routinely used to administer insulin injections to people suffering from diabetes. The insulin is delivered as a narrow stream of liquid under high pressure/speed and penetrates the skin with minimal discomfort. After skin penetration, the insulin is mainly deposited in the fatty subcutaneous tissue and is quickly absorbed. The physiology and histology of the skin of dogs and cats is generally the same as that of other mammals. The following five-task procedure and conclusion illustrate the results of the study.

## **Evaluation in recently euthanized dogs and cats for penetration and tissue deposition:**

The study shows that injections generally produced positive results. Good subcutaneous deposits of the dye solution injected were observed. Results indicated deeper injections than expected. This would not present a problem in a clinical setting, as many pharmaceuticals, insulin included, may be administered intramuscularly as well as subcutaneously.

Based on recommendations from this task, changes were made to the jet and a supplemental evaluation was conducted. The changes included the availability of 3 different jets to deliver injections to animals according to weight, size and skin type of the intended patient.

## **Disinfection procedure to prevent transfer of infectious agents:**

The cleaning and disinfection process is easy to carry out. Use of 70% isopropyl alcohol as disinfectant is readily available and inexpensive to consumers. This component of the study shows that the disinfection procedure, if applied according to manufacturers' recommendations, is effective against the bacteria and viruses tested.

## **Animal response to injection and efficacy of drug administration:**

The efficacy was evaluated with the administration of sedative with the injector. In general, the injections had the same efficacy as injections administered in a traditional manner. Dogs show very little aversion to the injection and administration was easy. Cats are much more reactive and may require a period of conditioning for ease of repeated administration.

## **Determine skin penetration and tissue deposition of injected material:**

The dye of the injection fluid frequently appeared to be removed by the normal functioning of the animal's body. The injection fluid would be absorbed and processed, including the foreign particles of the India Ink.

### **Clinical evaluation for treatment of diabetic dogs and cats:**

The observations presented that, in general, the blood glucose levels of the animals appeared to respond in a similar manner to injection with traditional needle and syringe. Cats were quite stressed on the first experience but on their second visit they were familiar with the routine and the blood glucose curves showed the expected response to insulin administration. The cats were accepting of the injection with the needle-free injector and they were not disturbed by the sound of the injection. The dogs reacted with certain discomfort but the volume of insulin may have been a factor as it was larger for the dog that showed the most reaction.

### **Conclusion:**

The injector appears to be an effective device for the administration of certain liquid materials in dogs and cats. As in humans, there is individual variation in the efficacy of the injector for injections to animals, and individual “fine-tuning” of the settings to make injections more comfortable.

The hair coat of the cats and dogs does not seem to be a problem for the injector, as long as the hair is parted and the injector nozzle positioned on the skin itself.

Although the emphasis of this study was on the usefulness of the injector as a tool for diabetes management, the substances that could be administered by injector do not need to be limited to insulin. Other drugs that can be administered subcutaneously may be given in this manner as well. The limiting factor for practical use is the limitation on volume of 0.5 mL.

*If you would like to review the complete study and other clinical information, please visit us at [www.zoepetjet.com](http://www.zoepetjet.com).*

\*Abstract from:

Applying the AdvantaJet Needle-less Injector System in Caring for Companion Animals.