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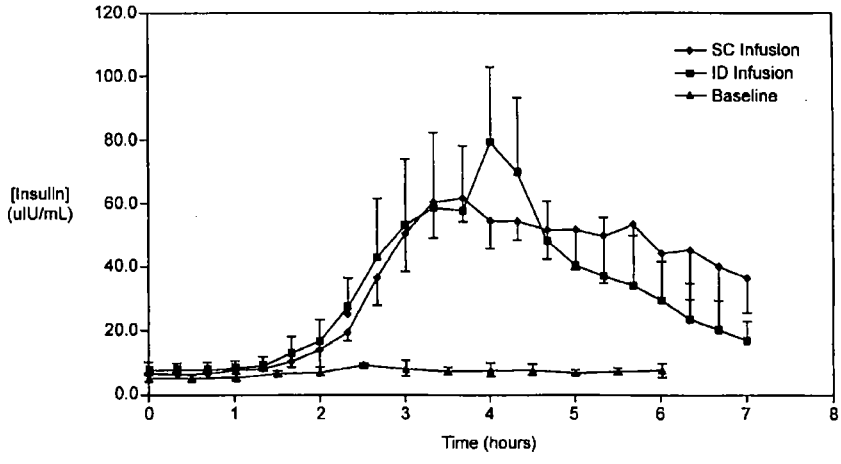
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(54) Title: NEEDLE FOR INTRADERMAL DELIVERY OF SUBSTANCES HAVING PENETRATION LIMITING MEANS



(57) Abstract: The present invention provides improved methods for ID delivery of drugs and other substances to humans or animals. The methods employ small gauge needles, especially microneedles, placed in the intradermal space to deliver the substance to the intradermal space as a bolus or by infusion. It has been discovered that the placement of the needle outlet within the skin and the exposed height of the needle outlet are critical for efficacious delivery of active substances via small gauge needles to prevent leakage of the substance out of the skin and to improve absorption within the intradermal space. The pharmacokinetics of hormone drugs delivered according to the methods of the invention have been found to be very similar to the pharmacokinetics of conventional SC delivery, indicating that ID administration according to the methods of the invention is likely to produce a similar clinical result (i.e., similar efficacy) with the advantage of reduction or elimination of pain for the patient. Delivery devices which place the needle outlet at an appropriate depth in the intradermal space and control the volume and rate of fluid delivery provide accurate delivery of the substance to the desired location without leakage.

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