

## **FACT SHEET: Risks of using the incorrect needle length - Cited Research Articles**

### Target audience:

This fact sheet is designed for Sub-Agents, to raise awareness of the importance of supplying the correct needle length.

### The importance of knowing the patient's subcutaneous tissue depth

#### *Fat thickness and insulin administration, what do we know?*

“The subcutaneous fat distribution on the human body obviously shows an enormous variation. There are also sex differences influenced by the sex hormones, women having more fat on thighs and buttocks and men having their fat more centrally distributed. One needs to remember though that we treat individuals, not statistical means.”

*(Reference: Infusystems International 2006, Volume 5, Pages 17-19, Frid A, Clinic of Endocrinology, University Hospital MAS, Malmo, Sweden)*

#### *Skin and subcutaneous adipose layer thickness in adults with diabetes at sites used for insulin injections: implications for needle length recommendations.*

“Knowledge of injection site skin and subcutaneous thickness in patients with diabetes is essential in the selection of the appropriate needle length and injection technique for insulin injection therapy.”

*(Reference: Current Medical Research & Opinion June 2010 Vol. 26, No. 6, 2010, Pages 1519–1530, MA. Gibney, CH. Arce, KJ. Byron, LJ. Hirsch)*

## Subcutaneous tissue depth required to avoid intramuscular injection

### *Reproducibility and variability in the action of injected insulin.*

“When the insulin is injected too deeply, it has a more rapid rate of diffusion, and, consequently, a shorter duration of action.”

“The difference in insulin kinetics depending on subcutaneous or muscular administration indicate the need for care in the choice of needle length.”

“proper use of the devices available to the patient is crucial: needle length adapted to the thickness of the subcutaneous skin, adequate re-suspension of the insulin, allowing sufficient time before withdrawing the needle, and the use of the same anatomical site for the same time schedule are all important elements that will reduce glycaemic instability.”

*(Reference: Diabetes & Metabolism February 2005, Volume 31, Issue 1, Pages 7-13, H. Gin, H. Hanaire-Broutin)*

### *Influence of needle size for subcutaneous insulin administration on metabolic control and patient acceptance*

“Injecting insulin in the vicinity of the capillary plexuses between fat and muscle layers carries the risk that insulin might be injected directly into muscle, thereby leading to faster resorption and increased risk of hypoglycaemia. Hypoglycaemia is an important adverse event with a reported mortality rate of up to 2-4%. Other possibly insulin injection-related side effects are pain, bruising, bleeding and insulin leakage after needle withdrawal, and lipodystrophy.”

*(Reference: European Diabetes Nursing June/August 2007, Volume 4, Issue 2, Pages 51-55, G. Kreugel, HJM. Beijer, MN. Kerstens, JC. ter Maaten, WJ. Sluiter and BS. Boot).*

## Subcutaneous tissue depth to allow maximum area for site rotation to avoid complications of lipohypertrophy

*The Second Injection Technique Event (SITE), May 2000, Barcelona, Spain.*

“A high daily requirement of insulin may be the first sign that lipos are present and should be a signal to the nurse and doctor to carefully check the injection sites. Repeated injection within the same area appears to be part of the cause of lipos, therefore a rotation scheme is the key interventional step. Daily insulin consumption may decrease by up to 50% when insulin is injected in non-lipodystrophic tissue...”

*(Reference: Practical Diabetes International, January 2002, Volume 19, Issue 1, Pages 17-21 K. Strauss et al (2002))*

## Patient comfort

*Comparative glycaemic control, safety and patient ratings for a new 4mm\32G insulin pen needle in adults with diabetes*

“Injection technique is also important for patient perceptions of pain and overall satisfaction... These findings indicate the importance of psychological and perceptual dynamics in pain assessments. Patients see the PN they use every day in real world use, and these attributes influence patient reaction to the needle and their acceptance of insulin injection therapy.”

*(Reference: Current Medical Research & Opinion Volume 26, Issue 6, June 2010, Pages 1531–1541, L.J. Hirsch, MA. Gibney, J. Albanese, S. Qu, K. Kassler-Taub, L.J. Klaff, TS. Bailey)*

*Approved by MESC on 4 November 2010.*