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Supporting Self-management of Diabetes With Education in the Pharmacy

THIS BRIEF TOOL PROVIDES INFORMATION to help pharmacists prepare for counseling sessions with patients with diabetes who use injectable therapy. The information below emphasizes the importance of diabetes self-management including recommendations by the American Diabetes Association (ADA) *Standards of Medical Care in Diabetes—2023*.¹

KEY COUNSELING POINTS

Glycemic control may involve different needs for each patient. Remind patients that their injection experience and glucose levels may be affected by injection variables that they can control, such as:

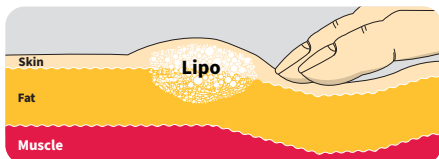
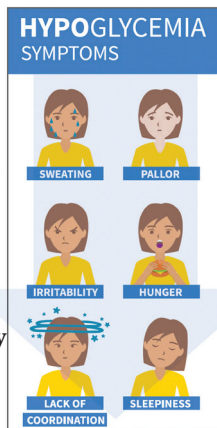
- using a new needle for each injection²;
- injecting with shorter (4mm pen needles and 6mm syringes) needles¹; and
- rotating injection sites.¹

RISKS OF BLOOD GLUCOSE VARIABILITY AND COMPLICATIONS ASSOCIATED WITH IMPROPER INJECTION TECHNIQUE

1. Correct injection site rotation appears to be the critical factor in preventing **lipohypertrophy**.³

2. **Lipohypertrophy** is an accumulation of fat that presents as soft, elevated areas of the skin disrupting the absorption of insulin and causes **glycemic variability** (changes in blood glucose levels).¹ In a study, **unexplained glycemic variability** was **7 times higher** in patients with **lipohypertrophy**.^{3,a}

3. **Unexplained hypoglycemia** (low blood glucose; < 70 mg/dL).¹ In one study, the rate of repeated **unexplained hypoglycemia** was more than **6 times higher** in patients with **lipohypertrophy**.^{3,b}



INJECTION TECHNIQUE TRAINING

Nearly 50% of patients with diabetes reuse their needles.² Reusing needles may cause them to dull, making injections more painful.¹ Practicing proper injection technique, including using a new needle for every injection, helps to reduce the risk of potential complications associated with reuse. In one study, patients with diabetes who were prescribed insulin and who received **structured injection technique training** by a clinician experienced a 1% reduction in hemoglobin A_{1c} (HbA_{1c}) level at 6 months.^{4,c}

PROPER INSULIN INJECTION TECHNIQUE^{5,d}

STEPS	INSTRUCTION
1	Choose an area. It is recommended that insulin therapy be injected into the subcutaneous space of the abdomen, thigh, buttock, or upper arm .
2	Disinfect the injection site.
3	Place a new, clean needle on the pen.
4	Prime the pen before injection to ensure adequate flow.
5	Insert the needle into the skin, and then press the thumb button to administer the medication.
6	Hold the pen needle in the skin for up to 10 seconds after insertion to prevent any medication leakage, and keep pressure on the button until the needle is withdrawn from the skin. ⁴
7	After use, discard the needle from the pen, and dispose of it properly.

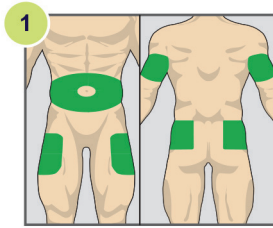
^dAlways check your pen manufacturer's instructions for use.

^a430 patients with diabetes who had been injecting insulin for at least 1 year were observed on their injection technique (ie, site rotation, area of injection, frequency of needle/syringe reuse) as well as the presence of LH. 49% of patients with LH reported having episodes of glycemic variability vs 7% without LH [P < .01]. "Glycemic variability" was defined as oscillations of blood glucose values from < 60 mg/dL to > 250 mg/dL at least 3 times a week in an unpredictable and unexplained fashion.³

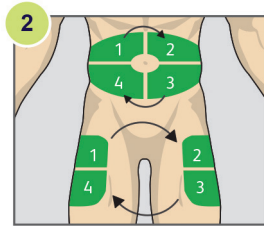
^b430 patients with diabetes who had been injecting insulin for at least 1 year were observed on their injection technique (ie, site rotation, area of injection, frequency of needle/syringe reuse) as well as the presence of lipohypertrophy (LH). 39% of patients with LH reported having episodes of unexplained hypoglycemia vs 6% without LH [P < .01]. "Frequent unexplained hypoglycemia" was defined as having a hypoglycemic episode (blood glucose reading of ≤ 61 mg/dL) one or more times a week in the absence of a definable precipitating event, such as a change in medication, diet, or activity.³

^cBased on an RCT pilot study, 116 patients with diabetes (mostly T2DM) on insulin were randomized into 3 groups to assess the change in A_{1c} over 6 months. Groups 1 and 2 received structured injection training and group 3 was the control. Baseline A_{1c} for all groups were similar (mean: 85-88% [± 1.4 - 1.9%]). At 6 months, mean [95% CI] reductions in A_{1c} from baseline were significant in groups 1 and 2 (-1.00% [-1.3 to -0.6%]) and -1.00% [-1.4 to -0.7%], respectively; P < .001 for both). The mean A_{1c} reduction in the group 3 was not significant (-0.02% [-1.2 to 1.6%]).⁴

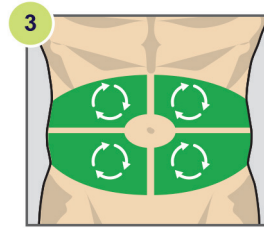
SELECTION OF INJECTION SITES AND ROTATION⁵



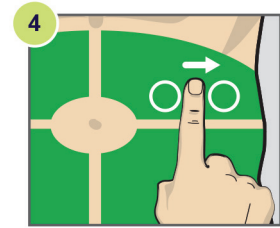
1 Choose an area for injection. Insulin therapy should be injected into the **subcutaneous space** of the abdomen, thigh, buttock, or upper arm.



2 Divide that area into 4 sections.



3 **Rotate injection sites** to prevent the development of **lipohypertrophy**.



4 Within each site, inject each new dose at least **1 finger width** away from where you injected your last dose.

DO ^{1,5}	DO NOT ^{1,5}
Use a new, clean needle for each injection. Remember to check your needle supply each time you refill your insulin.	Repeatedly reuse the same needle. Injection pain and increased risk of developing unhealthy tissue at the site of injection may occur.
Inject into the subcutaneous space for consistent insulin absorption.	Use too much force when injecting insulin, which can lead to inadvertent intramuscular (into the muscle) injection. This may increase the risk of unpredictable insulin absorption, unexplained hypoglycemia, and glycemic variability.
Rotate injection sites to prevent the development of lipohypertrophy.	Repeatedly inject insulin into the same skin site.

PEN NEEDLE SELECTION CONSIDERATIONS

Use of shorter needles (4-5 mm) can help patients to avoid intramuscular insulin injection regardless of their age, sex, body mass index, or obesity status.^{1,5} **Remember to ask patients if they need more needles when refilling a prescription for insulin.**

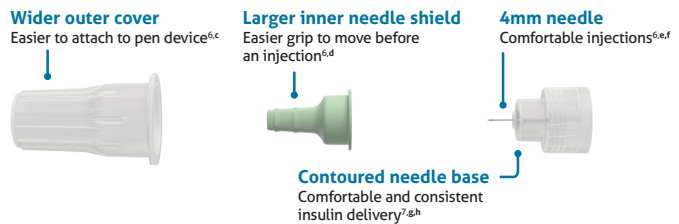
CONSIDER PATIENT-PREFERRED BD NANO™ 2ND GEN PEN NEEDLES.^{6,a}

EASIER INJECTIONS FROM START TO FINISH^{6,b}



NDC/HRI#: 08290-3205-50

PATENTED FEATURES INCLUDE:



^a226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of >0 mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs. all comparator groups combined for overall preference. [(P < .05) (Mean +17.5 mm, 95% CI, +10.3 to +24.7 mm)].⁶

^b226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of >0 mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs. all comparator groups combined for overall ease of use. [(P < .05)(Mean 19.9 mm, 95% CI, +13.8 to +25.9 mm)].⁶

^c226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of >0mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs all comparator groups combined for feeling more comfortable throughout injection experience. [(P < .05) (mean +18.0 mm, 95% CI, +11.6 to +24.3 mm)]. ^d226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of > 0 mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs. all comparator groups combined for ease of attachment. [(P < .05) (Mean +21.8 mm, 95% CI, +16.1 to +27.6 mm)].⁶

^e226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of > 0 mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs all comparator groups combined for ease of grip and removal of the inner shield. [grip (P < .05)(mean +23.8 mm, 95% CI, +18.1 to +29.4mm)]; [removal (P < .05) (mean +24.4 mm, 95% CI, +18.9 to +29.9 mm)].⁶

^f226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of > 0 mm; clinically significant difference of ≥ 5 mm).⁶

^gCompared to longer needles.⁶

^h226 patients with diabetes on insulin treatment were studied with a 150 mm visual analog scale (mean scores of > 0 mm; clinically significant difference of ≥ 5 mm). BD Nano™ 2nd Gen demonstrated superiority vs all comparator groups combined for feeling more comfortable throughout injection experience [(P < .05) (mean +18.0 mm, 95% CI, +11.6 to +24.3 mm)].⁷

ⁱ1188 injections administered in swine across a range of injection forces using 20 µl of iodinated contrast delivered with BD Nano™ 2nd Gen vs three 4 mm posted-hub pen needles. Measurements were obtained via fluoroscopic imaging. BD Nano™ 2nd Gen more closely achieved the 4mm target injection depth with less variability (P = .006).⁷

REFERENCES

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