

3.0 Injecting Process

3.1 Injection Site Care

- 1 The site should be inspected by the patient prior to injection. Injections should then be given in a clean site using clean hands. Fig 2 (61,62,63) **A 2**
- 2 Soiled skin should be cleaned according to basic common standards with soap and water. If alcohol is used to clean the site, the skin must be allowed to dry completely before the injection is administered. Fig 3 (64,65) **A 2**
- 3 Disinfection of the site is usually not required although local decisions may be taken in a clinical setting to do so. (32,66,67,68,69) **A 3**
- 4 Patients should never inject into sites of lipohypertrophy, inflammation, oedema, ulceration or infection, nodules, scar tissue, tattoos, hernias and stomas. (70,52,71,72,73,(74,75,76,77,78) **A 1**
- 5 Patients should not inject through clothing. (64) **B 2**

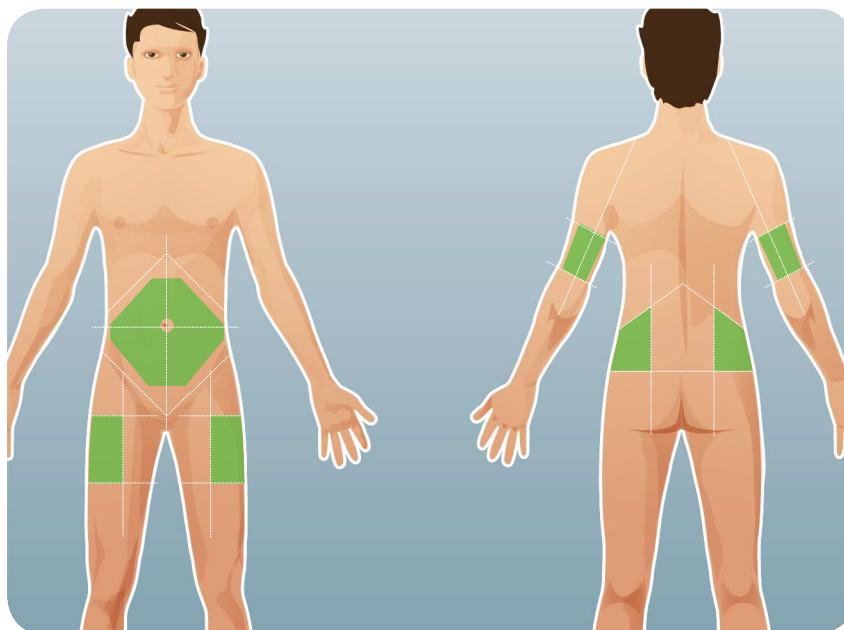


Figure 2:
Recommended injection sites.



Figure 3: Check the injection site. Ensure both the injection site and the injector's hands are clean prior to injecting.

- A** STRONGLY RECOMMENDED
- B** RECOMMENDED
- C** UNRESOLVED ISSUE

- 1** At least one rigorously performed study, peer-reviewed and published
- 2** At least one observational, epidemiologic or population-based study.
- 3** Consensus expert opinion based on extensive patient experience.

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3.2 Re-suspension of Cloudy Insulin

- 1 Cloudy insulins (e.g. NPH and pre-mixed insulins) must be gently rolled and inverted ten times each but not shaken until the crystals go back into suspension and the solution becomes milky white.
[Fig 4 and Fig 5](#)
(79,80,81,82,83,84) **A 2**
- 2 Invert the pen or vial and roll (a full rotation cycle between the palms). Inversion and/or rolling should be performed a total of 20 times immediately before every injection with cloudy insulin. **A 3**
- 3 Visually confirm that the re-suspended insulin is sufficiently mixed after each rolling and inversion, and repeat the procedure if crystal mass remains in the cartridge. (82,83,85,86) **A 2**
- 4 Vigorous shaking should be avoided since this produces bubbles which reduce accurate dosing. (82,83,85) **A 2**
- 5 Store unopened insulin in a refrigerator where freezing is unlikely to occur, as per manufacturer's instructions. (87,88) **A 2**
- 6 After initial use, insulin (in pen, cartridge or vial) should be stored at room temperature for up to 30 days or according to manufactures recommendations and within expiry date. Pre-mixed insulin pens and some of the newer insulins may vary – check individual manufacturer's recommendations. (89,90) **A 2**
- 7 **Storage of Insulin**
Insulin IN USE should be stored below thirty degrees Celcius but do not reffridgerate however, Insulin NOT IN USE should be stored in a reffridgerator (two to eight degrees Celcius), do not freeze, do not expose to direct sunlight. It should be allowed to warm up for approximately fifteen minutes prior to use for the first time. (87,88) **A 2**

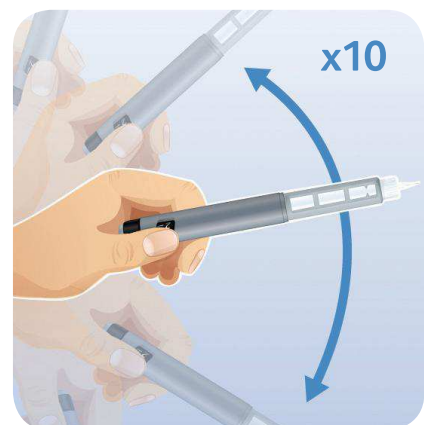


Figure 4: Re-suspension of cloudy insulin

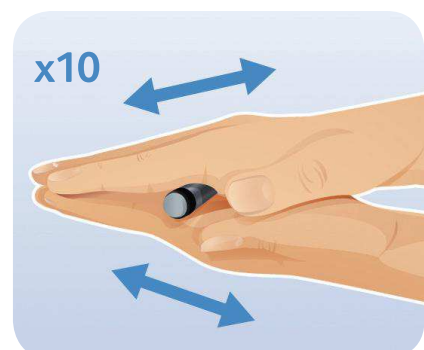


Figure 5: Re-suspension of cloudy insulin

3.0 Injecting Process

3.3 Needle Length

- 1 The 4mm pen needle inserted perpendicularly (at ninety degrees) is long enough to penetrate the skin and enter the subcutaneous tissue, with little risk of intramuscular (or intradermal) injection. Therefore it should be considered the safest pen needle for adults and children regardless of age, gender and Body Mass Index (BMI). (9,92,93,94,95) **A 1**

Longer pen needles increase the chance of injecting into the muscle, therefore it is crucial to perfect the technique for the needle you are using or switch to short pen needles.

- 2 The 4 mm pen needle may be used safely and effectively in all obese patients. Although it is the needle of choice for these patients, a 5mm needle may be acceptable. (96,97,98,99,100,101,102) **A 1**
- 3 The 4 mm pen needle should be inserted perpendicular (at ninety degrees) to the skin surface and not at an angle, regardless of whether a skin fold is raised. [Fig 6](#) (103,104) **A 1**
- 4 Very young children (6-years old and under) and extremely thin adults (BMI<19) should use the 4mm needle by lifting a skin fold and inserting the needle perpendicularly into it.

Others may inject using the 4 mm needle without lifting a skin fold. (58,100,105,103) **A 1**

- 5 When any syringe needle is used in children, adolescents or slim to normal weight adults (BMI 19-25), injections should always be administered into a lifted skin fold. (57,58,53,106,93,100,101,102,105,94,56,103,104,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131) **A 1**

- 6 Use of syringe needles in very young children (less than 6 years old) and extremely thin adults (BMI <19) is not recommended, even if they use a raised skin fold, because of the excessively high risk of intramuscular (IM) injections. (57,58,53,106,93,100,101,102,105,94,56,103,104,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131) **A 1**

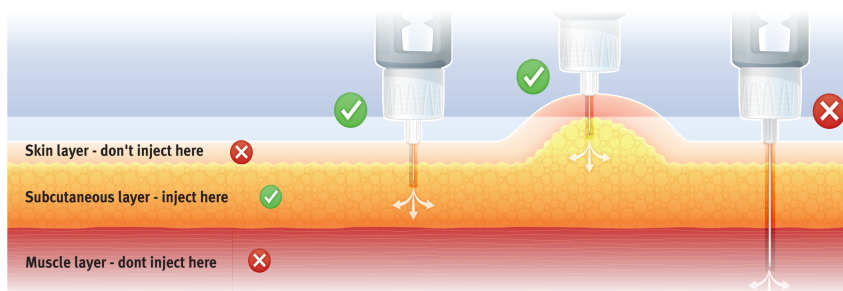


Figure 6: Intramuscular injection (IM)