



# Golden Rules

## Injection Technique in Adults<sup>1</sup>

1. Insulin and GLP 1 receptor agonists need to be deposited into healthy subcutaneous fat tissue, avoiding the intradermal and intramuscular spaces as well as scars and lipohypertrophy.
2. 4mm pen needles inserted at 90 degrees are recommended for all adults regardless of age, sex, ethnicity, or BMI. If patients need to use needle lengths >4mm or a syringe they must use a correctly-lifted skinfold to avoid IM injections.
3. Recommended sites for injection are **abdomen, thigh, buttock, upper arm**:
  - a. Abdomen within the following boundaries:
    - ~1 cm above symphysis pubis
    - ~1 cm below lowest rib
    - ~1 cm away from umbilicus and laterally at the flanks
  - b. Upper third anterior lateral aspect both thighs
  - c. Posterior lateral aspect of both upper buttocks and flanks
  - d. Middle third posterior aspect of the upper arm.
4. Detect and avoid injection into areas of lipodystrophy.
5. Rotation of injection sites is critical and can be correctly performed by:
  - a. Spacing injections within a site approximately 1 fingerbreadth apart
  - b. Using a single injection site no more frequently than every 4 weeks.



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1. Frid AH, Kreugel G, Grassi G *et al.* New Insulin Delivery Recommendations, *Mayo Clin Proc.* September 2016;91(9):1246. Accessible at [http://www.mayoclinicproceedings.org/article/S0025-6196\(16\)30321-4/fulltext](http://www.mayoclinicproceedings.org/article/S0025-6196(16)30321-4/fulltext)





# Golden Rules

## Injection Technique in Children<sup>1</sup>

1. Insulin needs to be deposited into healthy subcutaneous fat tissue, avoiding the intradermal and intramuscular spaces as well as scars and lipohypertrophy.
2. Injections should avoid bony prominences by one to two adult fingerbreadths  
Preferred sites are:
  - a. Abdomen, two adult finger widths away from umbilicus
  - b. Upper third anterior lateral aspect of both thighs
  - c. Posterior lateral aspect of both upper buttocks and flanks
  - d. Middle third posterior aspect of upper arms.
3. Consideration should be given to the type of insulin and the time of day when selecting injection sites due to the different absorption rates.
4. Correct rotation of injection sites are recommended at all times to prevent lipohypertrophy. 4mm pen needles are recommended for all children and young adults regardless of age, sex, ethnicity, or BMI.
5. Children and young adults are at risk of accidental IM injection. A two-finger lifted skinfold usually prevents IM injection but is much less effective in the thigh than in the abdomen.  
  
Lean children should use a lifted skinfold when the presumed skin surface to muscle distance is less than the needle length plus 3mm.



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# Golden Rules

## Treating and Preventing Lipohypertrophy<sup>1</sup>

1. All patients who inject or infuse insulin should have their sites checked at every regular visit, or at least every year:
  - a. Healthcare Professionals working with diabetes patients should be trained to correctly screen for lipohypertrophy and other site complications.
  - b. All persons who self-inject/infuse insulin or other injectables need be taught to self-inspect sites and be able to distinguish healthy from unhealthy tissue.
2. Healthcare Professionals should monitor and record evolution of lipohypertrophy, possibly using photography (with patient's consent), body maps with descriptors for size, shape, texture or transparent graduated recording sheets.
3. With patient consent, clinicians should consider marking the borders of all lipohypertrophy and other site complications with skin-safe single-use markers and instruct patients to avoid using marked areas until instructed otherwise.
4. Patients with lipohypertrophy who have been advised to stop injecting/infusing into affected tissue should be:
  - a. Allowed to experience the actual metabolic difference it makes to use normal tissue instead of lipohypertrophy (as this is a key to long-term adherence)
  - b. Informed that some pain may be experienced when injecting into normal tissue
  - c. Supported by a Healthcare Professional to monitor glucose levels frequently due to the risk of unexpected hypoglycaemia
  - d. Assisted in the reduction of their insulin doses in line with glucose results, knowing that reductions often exceed 20% of their original dose
  - e. Transitioned to 4mm Pen Needles/6mm Insulin Syringes or the shortest needle length available to minimise accidental IM risk
  - f. Encouraged to use the latest needle technology including 5-bevel needle tip, thin gauge and extra thin wall needles (if available) to minimise pain and discomfort, and maximise ease of dosing when injecting into healthy tissue.
5. All patients need to be supported to correctly rotate injection/infusion sites, and cautioned of the risk of re-using needles and associated injection site complications:
  - a. Principles of correct rotation technique should be taught to patients and rotation technique assessed at least every year and more frequently, if required.
  - b. Correct rotation ensures that injections are spaced out approximately 1 cm (one fingerbreadth) from each other and that a single injection site is used no more frequently than every 4 weeks.



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# Golden Rules

## Psychological Issues around Insulin Delivery<sup>1</sup>

1. All patients and caregivers should be offered general as well as individualised education/ counselling to facilitate optimal care.
2. Ensure all patients and caregivers are supported by their Healthcare Professional using patient-centred evidence-based psychological educational tools and strategies to achieve mutually-agreed goals.
3. Healthcare Professionals should be skilled in identifying psychological issues which impact insulin delivery.
4. Healthcare Professionals should adopt a range of therapeutic behavioural skills to minimise the psychological distress and the impact of insulin for their patients.
5. Various methods of minimising pain and fear of injection should be used in order to reduce psychological impact.



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# Golden Rules

## Needlestick injuries and Sharps disposal<sup>1</sup>

1. All Healthcare Professionals, employers and employees must comply with relevant international, national and local recommendations for the use of sharps collectors.
2. Sharp medical devices present a potential risk of injury and transmission of disease. All Healthcare Professionals and employers should ensure the safest possible working environment by:
  - a. Conducting regular risk assessment and providing continuing education and training
  - b. Providing and using a means of safe disposal of used sharps
  - c. Prohibiting needle recapping
  - d. Encouraging reporting of needlestick injuries.
3. Where available, safety engineered devices should be used by all Healthcare Professionals and third-party caregivers using sharps (e.g. injections, blood testing, infusion) in hospitals, clinics, and other institutions, such as schools and prisons. Best practice for pen needles requires that both ends of the needle be protected.
4. Safe sharps disposal requires that:
  - a. Correct disposal procedures and personal responsibility be taught to patients and caregivers by the dispensing clinician (including pharmacists) and be regularly reinforced
  - b. Safe sharps disposal systems and processes be present and known to all persons at risk of sharps contact
  - c. People in environments which pose a risk of injury and transmission of disease (e.g. care homes, schools, and prisons or around rubbish workers and cleaners) should be provided with safety education and safety devices
  - d. Patients diagnosed as having bloodborne diseases such as HIV and Hepatitis be supported to use safety-engineered devices and dispose of them safely
  - e. Sharps must never be placed directly in public or household rubbish.



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# Golden Rules

## Insulin Infusion<sup>1</sup>

1. Insulin infusion cannulas should be inserted into healthy subcutaneous fat tissue, avoiding underlying muscle as well as areas of skin irritation, scarring, lipohypertrophy and lipoatrophy.
2. If bleeding or significant pain occurs on insertion, the set should be removed and replaced.
3. Preferred sites for infusion cannulas should be individualised, but include the:
  - a. Abdomen, avoiding bony prominences and umbilicus
  - b. Upper third anterior lateral aspect of both thighs
  - c. Posterior lateral aspect of both upper buttocks and flanks
  - d. Middle third posterior aspect of upper arm.
4. Infusion cannula sites should be rotated to avoid complications. This usually involves moving to a new location. In-site duration should be individualised, but typically should not be more than 72 hours.
5. If kinking occurs, consider a shorter cannula or an oblique or steel set. If frequent silent occlusions or unexplained hyperglycaemic events occur, consider using a different type of infusion set, including a cannula with a side port, if available.



**Always refer to insulin pump manufacturer instructions for use.**

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