Introduction

The Forum for Injection Technique (FIT), India, released the second edition of its Recommendations for best practice in insulin injection technique in 2015.\(^1\) While the need to focus on insulin injection techniques in perioperative and intensive care settings has been highlighted earlier,\(^2\) the FIT2.0 has focused more on insulin usage in the outdoor setting. The FIT 2.0 recommendations do describe insulin use in indoor patients, but in brief. Keeping in view the high incidence of needlestick injuries, and inaccurate insulin technique, in nurses who inject insulin,\(^3\) there is a need to highlight insulin technique in indoor settings.

This addendum suggests best practices to be followed in hospitalized patients in detail. It discusses practices for safe insulin use and disposal in the Intensive Care Units (ICU) and noncritical care settings, and underlines the need to create insulin policies or insulin stewardship programs, similar to existing antibiotic policy guidelines and programs, in each ICU and ward.

While drafting this addendum, covering guidance on insulin use in indoor settings, inputs from infection control and nursing experts were taken at an expert meeting held on May 10, 2016 in Mumbai, India. This was done to ensure practicality and pragmatism in execution of these recommendations in an indoor setting or hospital setup. For a clinical consensus, the addendum was shared with members of the FIT India board for their views before it was finalized.
Critical care settings
• Each ICU should frame and follow an insulin policy, with equal emphasis on patient and health-care provider safety
• The policy should focus on appropriate insulin technique, including prevention and management of needlestick injury
• The ICU insulin policy should state the insulin preparation, strength, and delivery device to be used.
• Compatibility of insulin strengths and their delivery devices should be ensured.
• As far as possible, a single strength of insulin should be used in all patients in a hospital to minimize errors.
• In India, presently, it is recommended that only vials and syringes be used. Use of insulin pens eliminates the need for matching strength of insulin and delivery device.
• Insulin syringes should be stored away from other syringes
• At times, insulin syringes may be used for other purposes such as antibiotic sensitivity tests. Such syringes should be marked and stored separately
• Records of glucose monitoring, insulin dosage, time, and site of insulin must be maintained in indoor settings
• Such records may be on dedicated sheets, or may be part of the overall bedside medical charts
• Each patient should have his or her own insulin vial or pen, preferably kept at the bedside
• Each vial or pen should be labeled with the patient’s name and bed number/registration number
• Certain ICUs use a common insulin vial for all patients. A fresh syringe should be used to draw each insulin dose
• Emphasis should be laid on avoidance of syringe reuse, correct sharps disposal, and avoidance of needlestick injuries
• Needlestick injuries must be reported to higher authorities in real time, using standard reporting forms
• Intravenous insulin is the drug of choice for glycemic control in critical care settings.\textsuperscript{[4,5]}

Noncritical care settings
Insulin policy
• Each ward should frame and follow an insulin policy, with equal emphasis on patient and health-care provider safety
• The policy should focus on appropriate insulin technique, including prevention and management of needlestick injury
• The ward insulin policy should state the responsibilities of nursing and medical staff with respect to insulin prescription, counseling, storage, dose titration, administration, and disposal
• Insulin syringes should be stored away from other syringes
• At times, insulin syringes may be used for other purposes such as antibiotic sensitivity tests. Such syringes should be marked and stored separately
• Each patient should have his or her own insulin vial(s), kept at the bedside or in a common refrigerator
• Each vial or pen should be labeled with the patient’s name and bed number/registration number
• Subcutaneous insulin is the drug of choice for glycemic control in noncritical care settings\textsuperscript{[5]}
• As far as possible, a single strength of insulin should be used to minimize errors
• Use of insulin pens reduces the chances of error.

Injection responsibility
• Nursing and medical staff should assist in glucose monitoring, dose titration, and insulin injection when required
• Patients who are capable of self-injecting should be encouraged to administer their insulin doses themselves
• Patients who are unable to inject on their own should be administered insulin by nursing staff
• Records of glucose monitoring, insulin dosage, time, and site of insulin must be maintained in indoor settings
• Such records may be on dedicated sheets, or may be part of the overall bedside medical charts.

Injection technique
• Compatibility of insulin strengths and their delivery devices should be ensured
• Nursing staff must make every attempt to inject insulin over the abdomen or thigh
• Nursing staff must make every attempt to follow a proper rotation policy
• Rotation can be followed by marking sites of insulin injections with ink, after taking patient consent, and avoiding those sites for future injections
• Rotation can also be followed by recording the site of every insulin injection on a paper grid attached to the insulin dose chart
• Emphasis should be laid on avoidance of syringe reuse, correct sharps disposal, and avoidance of needlestick injuries
• Needlestick injuries must be reported to higher authorities in real time, using standard reporting forms.
**Patient education**
- Nursing staff should be aware that the insulin injection technique they practice will be followed by patients at home, after discharge.
- Medical and nursing staff should ensure that patients and/or their caregivers are adequately trained in insulin technique and disposal before discharge from hospital.

**Safe disposal**
Hospital staff are at high risk of needlestick injuries, and this predisposes them to blood-borne diseases. Safe disposal practices help minimize this risk. It is recommended that:
- Insulin syringes and pen needles should not be reused in indoor settings.
- Insulin syringes and pen needles should not be recapped.
- Insulin syringes and pen needles should be disposed of in dedicated sharps containers.
- Sharps containers should be available in every ICU, ward patient room, and at every nursing station.
- Insulin sharps should be disposed of in accordance with biomedical waste regulations.
- At discharge, patients and their care givers should be counseled about safe and environment-friendly disposal methods.

**Audit and appraisal**
- The ICU and ward insulin policy should be audited regularly by senior nursing and medical staff.
- Continuing nursing and medical education should be carried out to ensure proper insulin use and disposal in indoor settings.
- Such continuing education should factor the frequent turnover of nursing and resident staff in hospital settings.

**Summary**
These simple, yet succinct suggestions add value to the FIT 2.0 guidelines and should be useful for both nursing and medical staff. These suggestions should encourage creation of insulin policies, similar to antibiotic policies followed in the ICUs, in indoor settings.

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There are no conflicts of interest.

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