In this article...

Key developments in insulin administration safety
How an audit was conducted to analyse practice
Advice on standardising practice to ensure safety

Author
Anna Reid is diabetes nurse consultant, Guy’s and St Thomas’ Foundation Trust, London.

Abstract

Insulin is a life-saving medication but, if wrongly administered, it can cause death or severe harm. Errors in insulin administration are common, including the inappropriate use of intravenous syringes.

We surveyed all clinical areas in our trust to identify types of syringes and needles available and how these were stored and distinguished from IV syringes. Based on these results, we developed recommendations to promote safety and good practice and are standardising insulin syringes throughout the trust.

Over the past 18 months, several factors have prompted closer examination of insulin administration. These include:

- A report from the National Patient Safety Agency (2010a) on errors in insulin administration that led to death or severe harm;
- New recommendations from the Forum for Injection Technique on best practice in injection technique, including using needle lengths of 8mm and less to reduce the risk of intramuscular injection (Hicks et al, 2011);
- The expansion of the Department of Health’s (2011) “never events” list to include the maladministration of insulin.

This article discusses how we gathered data through audit and developed recommendations to reduce the risk of inappropriate insulin administration.

Context
Nationally, it is estimated that 15% of patients have diabetes (NHS Diabetes, 2011a), which means hospital nurses are likely to care for a patient with diabetes most working days. Diabetes is a complex condition, with a wide range of possible complications that lead to increased hospital admissions and longer stays. In 2009-10, people with diabetes in England had 160,000 more admissions than those without the condition of the same age, and experienced 570,000 extra bed days (NHS Diabetes, 2011b).

At Guy’s and St Thomas’ Foundation Trust, 17-22% of inpatients have diabetes, and, of these, 42% need insulin therapy. On some wards, such as cardiac care, 50% of patients have diabetes and, despite insulin being a common medication, anecdotally many health professionals report a lack of knowledge in its use and administration.

Nationally, errors in the administration of insulin by health professionals are regularly reported, with 3,881 wrong-dose insulin reports received by the NPSA over six years up to 2009 (NPSA, 2010b). The NPSA’s (2010b) alert identified two common errors in insulin administration:

- The inappropriate use of non-insulin (intravenous) syringes, which are marked in ml and not in insulin units;
- The use of abbreviations such as “U” or “IU” for units: when abbreviations are added to the intended dose, the dose may be misread, for example, 10U may be read as 100.

The NPSA (2010b) reported that three deaths and 17 other incidents occurred between January 2005 and July 2009 where an IV syringe was improperly used in insulin administration.

Nursing Practice
Innovation
Diabetes management

Errors in insulin administration are common and can cause harm and even death. An audit aimed to standardise insulin syringe storage and labelling to improve safety.

Changing practice for safe insulin administration

5 key points

1. Wrongly administered insulin can cause death or severe harm
2. Insulin must only be administered using an insulin syringe
3. Nurses must be able to identify the differences between IV and insulin syringes
4. Wards and departments must ensure that insulin syringes are labelled and stored clearly and are separate from IV syringes
5. An audit of practice can raise awareness and lead to recommendations for safe insulin administration
Method
An audit tool was developed that examined seven areas including storage, labelling and content, types of syringes available, needle size and the estimated risk of mis-selecting a 1ml IV syringe instead of an insulin syringe.

We discussed the proposal with the matrons, who agreed to support the audit in all 61 wards and departments identified to use insulin syringes. The audit was carried out by matrons, sisters and staff working in their own wards and departments.

Results
A total of 90% of targeted clinical areas returned the questionnaire (55/61). Three areas did not stock insulin and insulin syringes and were therefore excluded from data analysis, so 52 responses were analysed.

Storage
Clinical areas frequently had more than one syringe store: 96% (50/52) stored insulin syringes separately while 4% (2/52) had no separation between insulin and 1ml IV syringes.

Labelling and content
The majority (98%; 51/52) of respondents reported that storage was labelled to identify content; 90% (47/52) said the labelling included the descriptor “insulin”. One area reported that insulin and 1ml IV syringes were mixed together.

Insulin syringes and needle lengths
A variety of syringe and needle sizes was available within and across clinical areas, with 58% (30/52) using 50-unit syringes, 48% (25/52) 100-unit syringes and 8% (4/52) 30-unit syringes.

Packaging
There was a variety of packaging for insulin syringes within and across clinical areas.

The following points include some of the recommendations to highlight correct use and provision of insulin syringes to enable correct administration:

» All regular and single insulin (bolus) doses are measured and administered using an insulin syringe or commercial insulin pen device – IV syringes must never be used for insulin administration;

» All clinical areas and community staff treating patients with insulin should have adequate supplies of insulin syringes and subcutaneous needles, which staff can obtain at all times;

» An insulin syringe must always be used to measure and prepare insulin for an IV infusion (NPSA, 2010b).

Our approach
As part of the NHS Institute for Innovation and Improvement’s ThinkGlucose campaign (tinyurl.com/NHS-think-glucose), the trust’s safety and quality improvement in diabetes group monitors any insulin incidents and develops guidance, and has introduced practical procedures such as “hypo treatment” kits. The group has run a campaign to stop any use of abbreviations in insulin prescribing such as “U” or “IU” including training for all junior doctors, ongoing education events for nurses and screensaver alerts on prescribing.

Following these and other interventions, an audit of insulin prescribing showed an improvement from 85% to 100% compliance to prescribing in units. An insulin administration drug chart to support correct prescribing has recently been developed and is being introduced across the trust.

We undertook this audit of insulin syringes and storage to identify existing practice, possible areas of risk and how we could support wards and departments in further improving insulin safety.

The audit aimed to:

» Assess the existing safe storage of insulin syringes;

» Assess the availability of recommended needle lengths;

» Identify areas of good practice and share success trust-wide to ensure patient safety;

» Ensure compliance with the NPSA (2010b) alert;

» Reduce the risk of needles of inappropriate length being used in insulin administration;

» Implement measures to remove any risk of the inappropriate use of non-insulin (IV) syringes.

The following points include some of the recommendations to highlight correct use and provision of insulin syringes to enable correct administration:

» All regular and single insulin (bolus) doses are measured and administered using an insulin syringe or commercial insulin pen device – IV syringes must never be used for insulin administration;

» All clinical areas and community staff treating patients with insulin should have adequate supplies of insulin syringes and subcutaneous needles, which staff can obtain at all times;

» An insulin syringe must always be used to measure and prepare insulin for an IV infusion (NPSA, 2010b).

Our approach
As part of the NHS Institute for Innovation and Improvement’s ThinkGlucose campaign (tinyurl.com/NHS-think-glucose), the trust’s safety and quality improvement in diabetes group monitors any insulin incidents and develops guidance, and has introduced practical procedures such as “hypo treatment” kits. The group has run a campaign to stop any use of abbreviations in insulin prescribing such as “U” or “IU” including training for all junior doctors, ongoing education events for nurses and screensaver alerts on prescribing.

Following these and other interventions, an audit of insulin prescribing showed an improvement from 85% to 100% compliance to prescribing in units. An insulin administration drug chart to support correct prescribing has recently been developed and is being introduced across the trust.

We undertook this audit of insulin syringes and storage to identify existing practice, possible areas of risk and how we could support wards and departments in further improving insulin safety.

The audit aimed to:

» Assess the existing safe storage of insulin syringes;

» Assess the availability of recommended needle lengths;

» Identify areas of good practice and share success trust-wide to ensure patient safety;

» Ensure compliance with the NPSA (2010b) alert;

» Reduce the risk of needles of inappropriate length being used in insulin administration;

» Implement measures to remove any risk of the inappropriate use of non-insulin (IV) syringes.

The following points include some of the recommendations to highlight correct use and provision of insulin syringes to enable correct administration:

» All regular and single insulin (bolus) doses are measured and administered using an insulin syringe or commercial insulin pen device – IV syringes must never be used for insulin administration;

» All clinical areas and community staff treating patients with insulin should have adequate supplies of insulin syringes and subcutaneous needles, which staff can obtain at all times;

» An insulin syringe must always be used to measure and prepare insulin for an IV infusion (NPSA, 2010b).

Our approach
As part of the NHS Institute for Innovation and Improvement’s ThinkGlucose campaign (tinyurl.com/NHS-think-glucose), the trust’s safety and quality improvement in diabetes group monitors any insulin incidents and develops guidance, and has introduced practical procedures such as “hypo treatment” kits. The group has run a campaign to stop any use of abbreviations in insulin prescribing such as “U” or “IU” including training for all junior doctors, ongoing education events for nurses and screensaver alerts on prescribing.

Following these and other interventions, an audit of insulin prescribing showed an improvement from 85% to 100% compliance to prescribing in units. An insulin administration drug chart to support correct prescribing has recently been developed and is being introduced across the trust.

We undertook this audit of insulin syringes and storage to identify existing practice, possible areas of risk and how we could support wards and departments in further improving insulin safety.

The audit aimed to:

» Assess the existing safe storage of insulin syringes;

» Assess the availability of recommended needle lengths;

» Identify areas of good practice and share success trust-wide to ensure patient safety;

» Ensure compliance with the NPSA (2010b) alert;

» Reduce the risk of needles of inappropriate length being used in insulin administration;

» Implement measures to remove any risk of the inappropriate use of non-insulin (IV) syringes.
AReAs AVALIAble IN ClINICAl cant risk of mis-selection of an IV syringe

22% felt there was a moderate or significant risk of syringe mis-selection. Despite this, 12% (6/50) a significant risk of syringe mis-selection process to rationalise syringe availability is complete, to ensure 100% compliance with recommendations.

The results also highlighted that, although the majority of clinical areas used the recommended 8mm needle length, longer needles were available in 38% of areas, and syringes available in multipacks or loose making identification difficult in 11% of areas.

We have recommended standardising insulin syringes to improve consistent identification and insulin administration safety across the trust and this is being implemented.

References