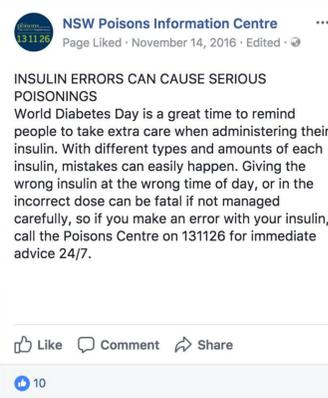


Not so sweet: insulin dosing errors reported to a Poisons Information Centre

Aim: To describe the number and types of medication errors with insulin reported to the largest Australian poisons information centre.

Brands involved in medication errors June 2016 – June 2017 (n=286)



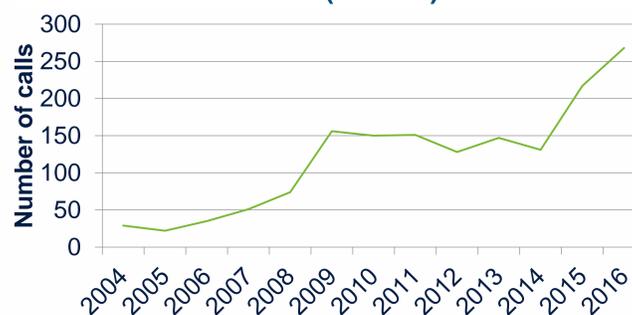
Facebook post by poisons centre alerting consumers for World Diabetes Day 2016

Brand name	Number of cases
Novorapid	118
Lantus	64
Novomix	23
Humalog	19
Apidra	18
Protaphane	11
Actrapid	9
Mixtard	9
Levemir	8
Unknown/unclear	3
Humalog Mix	2
Humulin R	1

Introduction

- Insulin is well established as a high risk drug in the hospital setting for potential medication errors.
- The prevalence and impact of insulin dosing errors in the Australian community setting is not well established.
- Lessons can be learnt from both settings to design medication safety interventions

Number of insulin medication errors by year, 2004-16 (n=1559)



Methods

- Retrospective review of calls made to NSW Poisons Information Centre (takes almost 50% of Australian poisoning calls, from health professionals and members of the public)
- Time period examined: Jan 2004 – June 2017
- Case definition: Call coded as exposure, therapeutic error, substance: insulin.
- RS individually reviewed and re-coded relevant details for cases July 2016 – June 2017.
- Descriptive analysis with Microsoft Excel.

Results

- 1722 insulin medication errors found
- Insulin dosing errors increased from 29 per year in 2004 to 268 in 2016.
- Further analysis of 286 cases in July 2016 – June 17:
 - Median age: 67 years
 - Interquartile range: 39-80 years
 - 63% female
 - 83% hospitalisation recommended
 - 86 calls documented as transferred/referred from another phone advisory service
 - Most common insulin brands involved:
 - 117 errors with Novorapid. More than half (n=61) were doses administered instead of Lantus; 32 administered the wrong dose of Novorapid.
 - 64 errors with Lantus. Most (n=45) administered the wrong dose.

Conclusions

- Further research into the circumstances surrounding the dosing error is needed. A prospective questionnaire administered the following day is planned by the poisons centre.
- Example information to collect: lighting, storage patterns, injection process, intercurrent illness, recent changes in therapy, education received, feedback regarding product design.
- Better documentation of dosing device vs insulin type is needed, eg hypothesis is that pre-filled pens are the most common.
- Improvements needed in patient education to reduce potential dose and device selection errors through improved medication dosing practices.

Discussion

- This large case series highlights errors made by consumers in the community. Insulin is amongst the highest risk of hospital referral for medication errors calls.
- Most errors are due to patient error in administration:
 - Administering the wrong insulin at the wrong time
 - Administering the right insulin at the wrong dose (mainly at the dose of their other insulin)
 - Double dosing
- Almost a ten-fold increase in insulin dosing errors since 2004.
- This corresponds to an increase in usage of insulin in the community. However, other possible explanations include: changes in the recommended insulin dosing regimens to increased use of basal insulin, the development of pre-filled insulin pens and product ranges which have similar appearance, changes in referral patterns from other triage services.
- The double peak in 2009 and 2016 requires further investigation.
- Medication errors are often not reported to traditional adverse event reporting schemes. In the same period, the TGA Database of Adverse Event notifications had 44 insulin medication error exposures recorded. This is only 2.6% of total reports to one poisons information centre.
- Limited data sharing with TGA from our poisons centre has commenced
- Poisons centres can play an important role in identifying product packaging & labelling issues and should be more actively involved in pharmacovigilance programs.

Further information

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Banner image from Lilly. Know Your Insulin Identification Chart. September 2016

