Tackling insulin safety using a multifaceted multidisciplinary regional approach

First report from The North East Regional Insulin Safety and Knowledge (RISK) project

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**Background**

Drug errors remain a significant risk area within the NHS. Insulin is acknowledged as one of the highest risk drugs, with over 5,000 patient safety incidents reported between 2003 and 2009 in England and Wales, including four deaths directly related to insulin errors.\(^1\)

In response to similar safety incidents within the North East region, the Safer Care North East initiative specifically identified Safer Use of Insulin as one of the three areas of drug safety in its clinical safety themes. The aim was clearly defined as a reduction in the number of patient safety incidents related to insulin by more than 50% by 2011. Unfortunately that objective was not achieved.

Additional evidence on the problems of insulin safety in hospital have been exposed in The National Diabetes Inpatient Audit (NaDIA). In the 2011 audit, insulin prescribing and administration errors for patients with diabetes in the foundation trusts across the NE in England ranged from 6% to 34%.\(^2\)

The RISK Project’s principle aim was to identify and implement strategies that will reduce the number of insulin errors and improve the care of people with diabetes on insulin therapy. The main focus of the initial project was focused around insulin safety in the inpatient setting and at the interface between hospital discharge and the community.

**Methods**

The RISK board was established under the auspices of Safer Care North East. The project was supported by NHS Diabetes and arm’s-length partners from several pharmaceutical companies. Working groups were established with specialist multi-professional clinical representation from every Acute Trust in North East England. In addition we sought input from: Primary Care; Commissioners; Diabetes UK; service users; and liaison with the North East Regional Specialty Training Committee for Diabetes and Endocrinology. A project manager and project board were appointed.

The project plan was based on the original Safer Care work and incorporated four workstreams with the aim of capitalising on collaboration that had already evolved across the region, providing a forum for sharing outcomes and processes and an opportunity to learn from each other.

Four work streams were responsible for taking the project forward:

- Developing a strategy for safer, systematic communication of information relating to insulin using the Six Sigma approach.
- Developing a regional inpatient insulin prescription chart for e-prescribing and paper designed for cross organisation adoption.
- Developing a standardised training package for professionals involved in insulin prescribing and administration, building on existing resources.
- Developing a regional insulin passport with local relevance to meet the requirements of NPSA/2011/PSA003 that all adult patients on insulin therapy receive a patient information booklet and an Insulin Passport.

Each workstream drew its membership from a broad group of disciplines related to insulin prescribing, administration or education. The workstreams tasked with the development of the NE regional insulin prescribing chart and the North East regional insulin education package had representation from each of the eight Foundation Trusts in the North East.
Lean Six Sigma approach to communication around insulin

Using the Six Sigma methodology, a process map was created which was used to inform the Moments of Truth, those points during a patient’s contact with organisations or healthcare professionals where insulin may be either initiated or subject to dose adjustment. This process was used to identify areas that would need to be considered in the communication of newly established standards for insulin communication.

Qualitative anecdotal information about the patient experience around insulin errors was collected and reflected upon.

Anecdotal evidence – patient stories from the professionals

Some anecdotes from the multidisciplinary experience are quoted here and are good illustrations of preventable risk.

Pharmacist: “She had been taking the wrong insulin. The previous prescription was a mix and she had been given Novorapid by mistake.”

GP: “I don’t know what dose they’re on so how can I prescribe the right amount on their repeat prescription? Patients tell me completely different doses to the last letter.”

Junior doctor: “They come in and don’t bring their insulin. I’m guessing some of the time and scared I get it wrong. I don’t know the pens and can’t remember all of the insulins. We’re all nervous about it. One woman had three different kinds of insulin in her bag of medication so we had no idea what she had been taking.”

Consultant: “He had a pen device which didn’t match his insulin cartridge so he had no way of giving his dose. He had attached a needle to the cartridge and then used a narrow pencil to push in the plunger guessing how much to inject. That was how he survived the weekend.”

Receptionist: “They come back repeatedly for prescriptions and get quite annoyed if it doesn’t last a full month. We don’t have all the information. Issuing lots of repeats can take up a lot of time but the doctors don’t like to prescribe too much so we’re caught in the middle.”

Diabetes Specialist Nurse: “She was given 25 units when it should have been 11 because it was Humalog Mix 25 and the district nurse was misled by the handwriting.”

Consultant: “It was only when I asked her if the insulin was clear or cloudy that she realised that she had been using the wrong type. It explained why she had been getting so many hypos but by that stage she’d lost her hypoglycaemia warnings.”

District nurse: “The fax usually just says which insulin, not the dose and we have to try ringing for more information. It can be really difficult getting details and patients can be very uncertain. It’s great if we have a copy of the insulin chart to refer to if they are just out of hospital.”
The process mapping and conversation about how people describe information about insulin informed a series of recommendations to standardise insulin communication. These were developed into the “Being forthright about insulin safety” message with the four essentials of prescribing:

- **Right insulin**: Using both the generic and trade names to prescribe insulin.
- **Right dose**: Documenting the dose in both words and numbers and never using the abbreviation of U for Units.
- **Right time**: Stating the time of administration as a meal time or bedtime.
- **Right device**: Ensuring the correct insulin delivery device is prescribed for the particular insulin.

A single poster about correct insulin prescribing was displayed in emergency departments, clinics, wards, pharmacies and GP surgeries (Figure 1). Audit data showing the quality of insulin hospital discharge prescriptions was collected before and after displaying the insulin communication posters.

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**Figure 1**: “Being forthright about insulin safety” poster
Following the displaying of the posters, a total of 78% of insulin prescriptions were correct (42% trade and generic names and 36% trade name for insulin mixes). This was an increase in the correct prescription of insulin of 57%. (Table 1)

Ninety-seven per cent of prescriptions had the dose stated, an improvement of 20%; of those, 51% had the dose prescribed as both words and figures. Ninety-eight per cent of prescriptions had a frequency specified, an increase of 15%. Of these, 65% were prescribed according to recommendations rather than using traditional non-specific descriptors, eg “BD”. Dictated letters coming from the diabetes specialist clinic were audited against the same standards. These initially reflected less improvement as a result of the poster and standards campaign. Surprisingly it took more dedicated re-education of specialist staff to achieve the same improvement as the non-specialist.

Table 1: The impact of the insulin communication strategy and posters on insulin prescribing practice.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed by trade and generic name</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>Dose written in words and figures</td>
<td>0</td>
<td>51</td>
</tr>
<tr>
<td>Time of administration indicated eg before breakfast</td>
<td>37</td>
<td>65</td>
</tr>
<tr>
<td>Device specified</td>
<td>87</td>
<td>91</td>
</tr>
<tr>
<td>Clear/cloudy indicated</td>
<td>0</td>
<td>83</td>
</tr>
</tbody>
</table>

Development of a North East inpatient insulin prescription chart and standardised North East inpatient insulin safety education strategy

To the outsider it might seem surprising that a junior doctor rotating from one hospital to another in their training is faced with a different method of insulin prescribing at each hospital. We proposed that this may be a factor contributing to the high level of insulin prescription errors in inpatients reported by the National Diabetes Inpatient Audit (NaDIA). Initially two workstreams were developed to look at the development of a North East inpatient insulin prescription chart and the standardisation of an insulin education package. It became clear as the workstreams progressed that one was dependent upon the other and the two pieces of work became united.
The North East inpatient prescription chart

Diabetes consultant leads from each trust were recruited to the workstream along with key representation from specialist pharmacist and diabetes specialist nurses, as it was recognised that insulin prescription charts in hospitals are usually designed by and treasured by each diabetes team! All current insulin prescribing charts were evaluated and compared by the workstream group, conscious of current best practice as defined by the NPSA insulin prescribing care bundle, following which a number of older charts were dismissed. The group kept in mind the following basic principles:

1. The chart should flow and follow the patients' journey through the hospital from admission to discharge.
2. Maintain safety as defined by the NPSA and provide some education to non-diabetes teams on the complexity of insulin prescribing.
3. Incorporate and promote a self-management plan for patients treated with insulin.
4. Facilitate effective communication on insulin type, dose and time to the patient, their carer and general practitioner at the point of discharge.

These key principles of the chart were put into practice by the ability to indicate clearly the patients' admission insulin type, dose and delivery device from a pre-printed list, and the linking of insulin times with meal times along with the endorsement of a self-management plan on the front page. The insulin prescription, documentation of administration and blood glucose monitoring were confined to the inner pages of the booklet, allowing an informed decision to alter the prescription based on blood glucose patterns. Clear documentation of hypoglycaemia occurrence was also incorporated. The final page led to a clear discharge insulin prescription tool encompassing the “being forthright about insulin safety” components identified in the Six Sigma project. (Figure 2).
Developing a North East inpatient insulin safety education programme

Having compared the process of staff education about insulin used in each of the eight Foundation Trusts and the proportion of staff that were being assessed, it was acknowledged that the current system only reached a very small percentage of staff involved in the prescribing and handling of insulin and there was no standardisation of curriculum. The group identified all those members of staff within a hospital trust who should receive training. The agreed group comprised:
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- all doctors
- all qualified nurses involved in drug administration
- midwives
- hospital based pharmacists and pharmacy technicians
- final year medical students in preparation for practice
- nurses on the preceptorship course.

Due to the large number of clinical staff who would require training, the method of education would need to be simple and deliverable on a large scale and in a rolling programme. A two-step training programme was devised on a similar format to basic life support training delivered on a large scale in most trusts.

In response to the early reports of high insulin prescribing and administration errors, NHS diabetes developed the online “Safer use of insulin” training package. This has been accessed by more than 70,000 NHS employees⁴ and provides generic basic safety training. None of the North East Foundation Trusts had yet incorporated this as part of their mandatory staff training although some had made it available on their trust training and education websites. The workstream concluded that the already validated NHS diabetes safer use of insulin package would provide the basic insulin safety training. This would be followed by a face to face standardised 20 minute teaching session specifically about the correct use of the North East insulin prescription chart. The group developed a scripted 20 minute training package for the insulin chart which could then be delivered by trained educators or diabetes staff, depending on the trust, to address the scale of the training programmes.

A letter was sent to all eight Foundation Trust chief executives and governance leads informing them about the work of the RISK project and requesting their support in the implementation of all the strategies including a mandatory insulin safety training programme for all the staff identified.

**Implementation of the insulin passport across the North East**

At the time of initiation of the RISK project, the NPSA had set a deadline of August 2012 for the implementation of insulin passports to all patients taking insulin. The fourth workstream was tasked with developing an implementation strategy and selecting a patient information leaflet for the insulin passport. This workstream had strong representation from medicines management teams who have been coordinating the roll out of passports across primary care. With the help of feedback from patient focus groups, the workstream concluded that the insulin passport patient information leaflet designed by June James from Leicester provided more patient accessible information about the insulin passport and insulin safety in general and this was the most appropriate patient information to go with the insulin passport. The passport itself was designed by NPSA and could not be adapted.
The North East RISK project: Next Steps

Phase one of this project has confirmed that, by taking a regional approach with the use of workstreams including stakeholders and experts from every foundation trust, a strategy for the standardisation of how insulin is prescribed and communicated can be achieved. We produced a set of standards and a campaign to communicate insulin more safely across NHS and other care boundaries, and incorporated the insulin prescribing standards into a regional insulin chart and standardised educational tool. The project was only deliverable by using a project manager to hold each workstream to task. The next step is to take the same approach of arm’s-length funding to provide project management for the roll out of the insulin communication Six Sigma messages and the insulin chart and education across all the North East Foundation Trusts.
References


4 Safer Use of Insulin E-learning module. www.nhsdiabetes.healthcareea.co.uk