IMPROVING INSULIN SAFETY IN HOSPITAL

Medication errors are not uncommon among people with diabetes admitted to hospital and the consequences for their health can be very serious. However, hospitals are making big efforts to address the problem. Rowan Hillson Award winners from Derby, Sheffield and London talk to Update about the work they are doing on insulin safety. Through its new Improving Inpatient Care programme, Diabetes UK will translate lessons learned from these examples of good practice to ensure hospital teams have the support they need to improve care for people with diabetes.
According to the 2016 National Diabetes Inpatient Audit (NaDIA), 38 per cent of inpatients with diabetes, across England experience a medication error during their hospital stay. This is leading to an unacceptable number of patients suffering from complications, including diabetic ketoacidosis (DKA) and hypoglycemia. Last year, 3,000 people needed treatment for DKA, which is something that should never occur in a hospital. In addition to this, 125,000 people had a hypoglycemic episode. This is a shocking statistic and emphasises the need for change. A hospital stay is an event that can encourage someone to make substantial positive changes to their lifestyle but, in too many cases, people with diabetes are receiving inadequate treatment.

Although the NaDIA paints a worrying picture, we know hospital teams are striving to improve care under immensely strained budgets. Through the introduction of innovative training programmes and electronic prescribing, medication errors are reducing. The use of technologies, such as virtual review of blood glucose readings, also means specialist teams are now able to proactively seek those patients most in need and make sure they have a care plan in place early on in their admission. Finally, trusts are introducing new measures to ensure self-administration policies are being used and that staff feel confident to support patients to self-manage their condition.

The Derby team

Derby inpatient Improvement Projects (DIPs)

Dr Suma Sugunendran, Consultant in Diabetes and Endocrinology, Beverley Eaglesfield, Lead Diabetes Inpatient Specialist Nurse and Dominic Moore, Lead Pharmacist, Royal Derby Teaching Hospital

Derby Teaching Hospital Foundation trust has 1,139 beds and 1.8 WTE DISN supporting inpatient diabetes care, with 0.2 podiatry and 0.16 consultant time. We cover a population of 637,900, of which 35,003 have diabetes. In 2012 and 2013, the NaDIA showed we had higher numbers of medication, prescription, management and insulin errors compared with the national average. In addition, we had higher rates of severe hypoglycaemia, and were performing suboptimally in foot screening. We had 175 errors identified through incident reporting and even had a ‘never’ event in 2014. Passionate about patient safety, we formed the Derby Insulin Safety Group comprising a senior DISN, a pharmacist, the Head of Patient Safety, Quality and Improvement and a consultant diabetologist. This combination of professionals facilitated change at multiple levels across nursing, pharmacy and medical teams and aimed to improve the standards of all aspects of diabetes care in the hospitals. The overall aim of the team was to improve the standards of all aspects of diabetes care throughout the hospital.

We ran a package of several mini projects to address the various problems which were identified. These projects were:

**Insulin Safety Group**

A focus group, which included all the major stakeholders for effective change (as described above) was created. Its members kept in touch with other significant stakeholders, including non-specialist nurses, pharmacists and junior doctors. This was done through various schemes, including link nurse meetings, education sessions for nurses, healthcare assistants, pharmacists and junior doctors, error reporting, IT department and patient feedback.

**Table 1 Comparison of NaDIA 2013 and 2015 (DIPs outcomes)**

<table>
<thead>
<tr>
<th>Area of improvement-NaDIA</th>
<th>2013</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication errors</td>
<td>41.4%</td>
<td>27.4%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Prescription errors</td>
<td>14.9%</td>
<td>8.3%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Management errors</td>
<td>29.9%</td>
<td>19.8%</td>
<td>18%</td>
</tr>
<tr>
<td>Insulin errors</td>
<td>20.7%</td>
<td>10.4%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Foot risk assessment during stay</td>
<td>17.1%</td>
<td>50%</td>
<td>60%</td>
</tr>
<tr>
<td>% of severe hypos</td>
<td>9.8%</td>
<td>4.4%</td>
<td>8.4%</td>
</tr>
</tbody>
</table>
Conclusion:
We managed this significant improvement in patient care with no additional resources – just by thinking and acting differently and better utilisation of existing resources. All the schemes we have done are easily reproducible and can be integrated into an inpatient diabetes service in any hospital.

Electronic prescription optimisation
The introduction of Electronic Prescriptions and Medicines Administration in 2012 helped reduce prescription errors from 33.9 per cent (NaDIA 2012) to 14.9 per cent (NADIA 2013) by avoiding use of abbreviations like U and IU. To address limitations and improve safety, we collaborated with pharmacy and the IT department and introduced changes to optimise our electronic prescription and medicines management.

Staff awareness campaign
In addition to increasing staff education, we pioneered several schemes to increase staff awareness, such as link nurse meetings, laminated insulin profile charts in all areas and credit card-sized pocket information for all junior doctors and nurses. These included all the management guidelines for hypoglycaemia, hyperglycaemia and insulin profile charts and contact number for DISNs.

We made efforts to share learning through weekly prescribing letters and link nurse networking meetings.

Quality assurance
Although we implemented many of the above solutions, we continued to see errors, especially with suboptimal management of hypoglycaemia and hyperglycaemia and poor uptake of foot screening for patients with diabetes. This prompted us to envisage a system which will ensure quality assurance. We decided to include the above parameters in the ward assurance audits done by senior nurses in all wards on a monthly basis.

Point of care analysis of hypos on a monthly basis
All of these resulted in dramatic improvements in our NaDIA results in 2015 and 2016 (Fig 1, Fig 2, Fig 3 and Table 1) and we rose above national average in these areas in the 2015 NaDIA. Many of the improvements were sustained in 2016.
A pharmacy-led initiative to support insulin self-administration

Sallianne Kavanagh, Health Education Leadership Fellow: Safer Diabetes/Lead Clinical Pharmacist Diabetes, Sheffield Teaching Hospital NHS Foundation Trust

Following the publication of the Joint British Diabetes Societies recommendations for the self-management of diabetes during hospital admission, the Trust amended its policy, stating that people taking insulin could continue to self-administer. However, experience indicated that barriers, including patient access to insulin for self-administration, still existed. The pharmacist led a series of projects, including audits, incident reviews and service user interviews. The information from the projects was used to develop risk assessments and options appraisals that were presented to the Medicines Safety Committee (MSC). This resulted in further policy change, permitting patients to maintain possession of their own insulin and continue self-care.

The aim was to support people prescribed insulin to continue to self-administer while in hospital, if willing and capable. There were to be audits to determine if appropriate patients are self-administering in hospital, if the practice complies with the local policy, and, subsequently, evaluate if the current policy is supporting patients.

Baseline audit

A trust-wide one-day snapshot to assess insulin storage and self-administration status, at home and in hospital, was undertaken. Results identified 41/71 patients self-administered at home, four weren’t suitable to continue, 30 were self-administering and 23 had insulin access (outside of policy). Two wished to self-administer, but were not supported. Re-audit, following further policy change, identified 7/15 patients were appropriate to self-administer. Of these, three were independent with access to their insulin, three were being observed, due to new or changed therapy, while the remaining patient requested assistance.

Risk assessments, options appraisal

A selection criterion was assessed for the available commercial storage options, including security, infection control, suitable for use in all areas, nurse accessibility and patient accessibility and acceptability. Two of 10 storage options reviewed met the criteria. A business assessment of these proved to be prohibitively expensive, and still didn’t meet the needs of patients, nurses or the Trust.

Datix® review

The system was reviewed for insulin-related incidents, specifically for self-administration or misappropriation. Fifty one incidents were identified, including two cases of the patient giving the correct dose, despite a wrong prescription, 20 preventable incidents, if the patient had been self-administering, two cases of duplication and four cases of the patient giving the wrong dose.

Following review of the options appraisal, risk assessments and Datix® review, the MSC recommended that the policy be amended to support patients to maintain possession of their insulin.

Patient focus groups

The pharmacist worked with the local Diabetes UK group to discuss people’s experience. The main points of concern were not having access to their insulin and doses being given at the wrong time.

Pilot of self-administration focused service

A pharmacist assessment of people with Type 1 diabetes admitted to one site reviewed suitability to self-administer and documentation of competence. The review covered 17/27 admissions and found documentation needed updating (12 patients), competence assessment completed (seven patients), of whom five were fully self-administering, and two were receiving support.

The policy changes are supporting patients to self-administer. The pharmacy-led service plays a valuable role in supporting insulin self-administration. The projects undertaken, although completed by a pharmacist, could mostly be undertaken by a pharmacy technician, with support from a pharmacist, when needed, offering a more cost-effective service for the Trust.

Operation Pharmacist: Ending the Highs and Lows of diabetes

Sara Qureshi, Lead Pharmacist, Theatres and Anaesthetics, St George’s University Hospitals Foundation Trust

Patients with diabetes have complex medical needs, which are heightened when faced with surgical intervention. Multiple national priorities began to push the perioperative clinical needs of diabetes patients to the forefront. Alerts and reports appeared, surrounding insulin and diabetes medication. Then there were local priorities, such as reduction in cancellations, delays to operating lists and improving patient flow. So the scene was set for us to put forward a novel proposal.

This was to introduce highly skilled diabetes specialist prescribing pharmacists to the preoperative setting in order to optimise and pre-empt medicines management issues pre-surgery, and with a fixed referral pathway to a diabetologist to escalate and manage more complex patients. This would allow collaboration and better utilisation of skill sets of other healthcare professionals (HCPs) involved in the patient’s surgical care. This exciting proposal was successfully awarded funding by South West London Small Grants scheme for a four-month trial in 2014. Success implementing the service was underpinned by the collaboration between pharmacists working across the breadth of the surgical pathway. From preoperative care, to theatres, recovery, ward and, finally, discharge, pharmacists ensured the bespoke plans were actioned and communicated, with excellent feedback from surgeons, anaesthetists and diabetes teams.

One hundred and five patients were seen and all of them received a written management plan, with active patient/carer participation, had their glycaemic control scrutinised, then optimised, were given preventative health screening and interventions performed. Although the aims and objectives appear extensive, they are highly achievable due to this simple notion – to engage the patient proactively and prospectively provide clinical management plans for the perioperative period. This straightforward idea has impacted directly on improving clinical objectives and, in turn, service outcomes and user satisfaction.
Insulin Safety

The aims were successfully achieved in all patients. Pre-made clinical decisions helped reduce length of fasting time, reduce prescribing of unnecessary insulin infusions and selecting appropriate insulin scale in advance where required. Admission blood glucose levels were within 4–12mmol/l and patients were actively placed on the first third of the operating list as recommended, thereby avoiding unnecessary admission the night before and, therefore, the need for intravenous insulin. This led to active avoidance of 10 cancellations due to poor glycaemic control, contrasting with 2–3/month prior to intervention. Cancellation avoidance and promotion of same day admission led to estimated savings upward of at least £35,000. Patient safety improved, as diabetes medication-related error reporting subsided. Encouraging patients to self-manage diabetes by promoting ownership, control and reducing the time the patient was unable to self-manage, led to 100 per cent positive reviews from satisfaction surveys.

The work captured the interest of a variety of HCPs and bridged the gap within the wider multidisciplinary team (MdT). The identification and referral of patients by preoperative staff to the specialist pharmacist meant clinical issues as a direct result of diabetes and medication were able to be proactively resolved well in advance of the planned surgery, as opposed to previous practice of troubleshooting on the day by inexperienced clinical staff. Patients identified as complex had specialist input from an experienced diabetologist. The previous reactive approach led to inefficient working practices, affecting patient flow and potential risk surrounding inappropriate intravenous insulin regimen selection and medication interruption. With the new approach, preoperative staff highlighted the benefits of being able to refer to a specialist and focus attention to their area of expertise. This has had a positive impact on both patient and clinician satisfaction.

Since completion of this work, the data has led to creation of permanent pharmacist support. There has since been a drive to upskill the pharmacy workforce through specialist diabetes workshops and simulation projects to support patients. However, more work is being conducted to permanently embed this role as part of the MdT nationally as part of feedback from the awards entries.

If you would like more information about how you can improve diabetes inpatient care in your trust, please email: inpatientcare@diabetes.org.uk

Further Reading

*The St George’s team*

**With the new approach, preoperative staff highlighted the benefits of being able to refer to a specialist and focus attention to their area of expertise.**

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The Rowan Hillson Award. www.diabetes.org.uk/joint-british-diabetes-society


