How system changes improve inpatient diabetes care beyond education alone

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Abstract
Most hospitals have implemented Think Glucose but, despite this, the National Inpatient Diabetes Audit continues to demonstrate that further improvement in inpatient diabetes care is required. We show how process changes through the use of IT systems and audit can improve outcomes beyond health care professional education alone. Copyright © 2014 John Wiley & Sons.

Key words
diabetes; inpatient; foot; Think Glucose; referral; charts

Introduction
The National Inpatient Diabetes Audit (NaDIA) has demonstrated that improvement in inpatient diabetes care is required. In 2012, 15.3% of hospital beds were occupied by people with diabetes in England and Wales. Despite the growing number of people in hospital with diabetes, there is no significant change in the size of the diabetes inpatient multidisciplinary teams (MDTs), which in many areas are under significant pressure.

Many areas have focused on staff education to facilitate improvement in inpatient diabetes care. NaDIA 2012 reports that 68.8% of patients feel the staff caring for them had sufficient knowledge about diabetes. However, despite this, one-third of patients did not have a foot assessment, and only just over a half of patients who require specialist diabetes MDT review were actually seen. We therefore developed a computer-based system to facilitate teams to perform diabetes assessments.

In order for a small diabetes MDT to work effectively there need to be clear guidelines on which patients require referral and a simple, rapid referral mechanism. Think Glucose provides us with guidance on who to refer to the diabetes team.

All hospitals, who took part in NaDIA 2012, report implementing the Think Glucose programme, or a locally adapted version; however, despite these guidelines, there is still a barrier to patients actually being seen.

The electronic whiteboard
Within our hospital we have an electronic whiteboard (EW) that lists all people in hospital. The EW is linked to the retinal screening database. If the patient is listed on the retinal screening database, then a symbol depicting that they have diabetes appears next to their name to alert the patient’s team that they require a diabetes assessment (Figure 1). The symbol can be easily added by nursing or medical staff for patients who are not on the retinal screening database – e.g. they are from outside that region, or have a new diagnosis of diabetes.

Diabetes assessment
Initially, the diabetes symbol appears in blue colour. The nursing or medical team caring for the patient click on the symbol to open a window that has three sections.

The first section lists the Think Glucose referral criteria, using the red, amber, green traffic light system. The operator clicks next to the most appropriate option in the list which turns the diabetes symbol to the appropriate colour, e.g. selecting ‘patient admitted with DKA’ turns the diabetes symbol red, whereas selecting ‘good diabetes control’ turns the diabetes symbol green. The diabetes MDT can then select to view all patients on the EW with diabetes and have an instant indication of which patients require review. When they see the patient, they add a ‘seen’ message to the symbol. This can be used to monitor how many patients the diabetes MDT see and how long it takes between referral and review.
The second section of the diabetes EW assessment is a foot assessment. In this section, the operator is required to tick whether the patient is at high or low risk of developing foot ulceration while they are in hospital, utilising the Ipswich Touch Test. Patients who are at high risk require a daily foot assessment and this is recorded on the back of the blood glucose monitoring chart.

The final section lists circumstances where the patient should be referred to a dietitian. If the patient meets these criteria, then an instant referral is made to the dietetic team.

All three sections of the assessment require completion before the page can be updated. Each section only requires one tick and instantly provides the diabetes MDT with useful information. If the full assessment has not been completed within 24 hours, the diabetes symbol begins to flash to remind the ward team that an assessment is needed. This also facilitates the diabetes MDT in knowing which areas of the hospital may require more support and education.

**Save time**

Ward environments are busy and medical and nursing teams are often stretched. The value of this system is that it can save time as referrals are made in seconds and do not require either referral cards to be written and delivered or phone calls or bleeps to teams who may not be instantly available to answer.

The diabetes MDT know which patients in the hospital require review and are released from answering all but urgent telephone referrals.

**Making diabetes a priority**

We recognise that it is necessary to maintain momentum to encourage the use of any system and to ensure that the ward teams appreciate the importance of diabetes care.

To facilitate this, we produce a monthly report consisting of the time it takes each individual ward to complete the diabetes assessments for its patients. In addition, each ward’s link nurse or matron completes a prospective audit of five patients.

The audit reviews whether patients on insulin have had it accurately prescribed and administered; whether patients who are competent to self-administer their diabetes medication have been given the opportunity to do so; and the ward’s compliance with testing blood glucose levels on admission.

The report is fed back to the trust Patient Safety Group and a quarterly summary is given to the hospital’s board.

**Does the system improve outcomes?**

The NaDIA 2012 report for the Royal Devon and Exeter Hospital showed significant improvements from previous years. For example, the number of patients who had a foot assessment during their stay rose from 30.5% in 2010 to 90.4% in 2012, and the number of patients seen by the diabetes MDT rose from 19.2% in 2010 to 32.4% in 2012 (Table 1). There is still room for improvement, and not all of the changes described above were in place when NaDIA 2012 took place, but we feel that these system changes have significantly improved the care of people with diabetes in our hospital.
Practice point

How system changes improve inpatient diabetes care beyond education alone

<table>
<thead>
<tr>
<th>Variable</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ‘Good diabetes days’ in the last 7 days</td>
<td>3.5</td>
<td>3.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Percentage of patients visited by the diabetes multidisciplinary team (%)</td>
<td>19.2</td>
<td>25.3</td>
<td>32.4</td>
</tr>
<tr>
<td>Percentage of patients receiving a foot assessment within 24 hours of admission (%)</td>
<td>25.4</td>
<td>11.9</td>
<td>76.9</td>
</tr>
<tr>
<td>Percentage of patients receiving a foot assessment during their admission (%)</td>
<td>30.5</td>
<td>17.9</td>
<td>90.4</td>
</tr>
</tbody>
</table>

Table 1. Royal Devon and Exeter Foundation Trust National Inpatient Diabetes Audit results for the years 2010 to 2012

Summary

The multidisciplinary diabetes team at the Royal Devon and Exeter Foundation Trust have implemented a range of measures over the last few years that have helped to improve diabetes care in our hospital, ranging from introducing national guidelines and initiatives such as Think Glucose to adapting prescription charts and improving education. In addition to this, we have demonstrated how a computer system can help facilitate diabetes assessments on a busy hospital ward while providing audit data that help motivate ward teams to reach the required standard of care for diabetes. Our results from the National Inpatient Diabetes Audit show an improvement in outcomes, although there is still room for further improvement. Motivating the whole trust to recognise the importance of inpatient diabetes care can be challenging, but the electronic whiteboard and audit reports have helped to raise the profile of diabetes.

Declaration of interests

There are no conflicts of interest declared.

References


Key points

- Health care professional education alone does not result in sustained improvement in the care of people in hospital with diabetes
- IT systems can aid diabetes assessments and referrals while saving time for ward staff
- Monthly outcome reports help motivate ward staff and guide specialists as to where further education is required

Book review

Gestational diabetes: origins, complications and treatment

Edited by Clive J Petry
Published by CRC Press, 2014
239 pages, price £63.59 hardback
ISBN: 978 1 439879962
Website: crcpress.com

As the recognition of gestational diabetes (GDM) is growing worldwide due to the increasing prevalence of obesity, this comprehensive book provides a timely summary of the literature covering all the clinically relevant aspects of GDM. The book has nine chapters in total, grouped together in five sections. Each chapter is contributed by international experts in the subject and provides all the relevant references. A very well referenced first chapter around metabolism details the current understanding of available evidence on various mechanisms of maternal insulin resistance and factors leading to fetal overgrowth.

Chapter two summarises the history of GDM and current controversies regarding diagnostic criteria. The next two chapters are around the non-genetic and genetic risk factors of GDM. The effects of maternal pre-pregnancy weight and gestational weight gain among other maternal and environmental factors are described. Also discussed are GDM-specific genetic risk factors and potential future avenues where understanding of genetics could play a role in predicting future risks of type 2 diabetes.

In the next chapter, complications of GDM are summarised as short-term and long-term effects on maternal, fetal and neonatal outcomes. The subsequent three chapters are about the treatment options, the first one focusing on dietary therapy with the appreciation that almost 90% of women with GDM will achieve required glycaemic targets with dietary modification. Exercise to prevent GDM and in women with GDM is described in the next chapter which draws attention to the limited literature. Outcomes of major randomised controlled trials involving relevant pharmacological treatments are listed and described in more detail in a subsequent chapter.

The final chapter describes the future prospects in this field and lists gaps in the current understanding of GDM, along with some of the key research questions.

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