

Insulin-treated inpatients and prescribing errors

June James

Introduction

The National Service Framework (NSF) for diabetes clearly aims for people with diabetes to receive effective care of their diabetes during admission to hospital; however, local audit and patient feedback has revealed common themes in respect of adverse prescribing in insulin treated patients. This article explores prescribing errors in diabetes from a local, national and international perspective, why they occur and how they may be prevented in order to improve the inpatient experience and meet the requirements of the NSF.

The diabetes specialist nurse (DSN) role exists to educate and support people with diabetes and their families at all stages in their lives (Royal College of Nursing [RCN], 1991), including those admitted to hospital. People with diabetes often experience anxiety and concern regarding management of their diabetes during hospital admission (Audit Commission, 2000; Hiscock et al, 2001). The National Service Framework (NSF) for diabetes (Department of Health [DoH], 2001a) recognised patients' concerns and highlighted specific areas to be addressed, including:

- Inadequate knowledge of diabetes among hospital staff
- Lack of written patient information for people with diabetes
- Issues around the importance of giving the correct insulin at the correct dose, including errors in the administration of insulin.

Standard 8 of the NSF specifically states:

'All children, young people and adults with diabetes admitted to hospital, for whatever reason, will receive effective care of their diabetes. Wherever possible, they will continue to be involved in decisions concerning the management of their diabetes' (DoH, 2001a, p. 33).

Shortfalls in service identified locally in addition to those recognised on a national level include a high level of

adverse events relating to the care of people with insulin-treated diabetes admitted to hospital. This article specifically explores prescribing errors in relation to inpatient diabetes care, taking an international, national and local focus.

International perspective

A literature search in respect of adverse events and diabetes revealed papers predominantly from the United States of America (USA) and the United Kingdom (UK). The USA led the way in discussion regarding this issue. Literature reviews revealed issues around terminology, determining whether incidents were defined as medical errors or adverse events. The Institute of Medicine (DeLisa, 2004) describes medical errors as:

'The failure to complete a planned action as intended or the use of a wrong plan to achieve an aim'

and highlights medication errors as a common cause of error. DeLisa advocates that medical errors do not necessarily result in harm (p. 576). An adverse event is described as:

'An unintentional injury caused by medical management rather than by the underlying disease or condition of the patient, this can include physical or emotional harm, increased length of stay, or additional costs to treat the injury.' (DeLisa, 2004, p. 576)

ARTICLE POINTS

1 Shortfalls in service identified locally in addition to those recognised on a national level include a high level of adverse events relating to the care of people with insulin treated diabetes admitted to hospital.

2 A new confidential reporting system for the recording of adverse events has been launched which will report on trends in medical errors and promote a learning culture in the NHS.

3 The nurses caring for diabetes patients would recognise poor prescribing and ensure that insulin was correctly prescribed.

4 Prescribing errors relating to diabetes inpatient care both locally and nationally are common and often preventable.

KEY WORDS

- Insulin
- Inpatients
- Prescribing errors
- Nurse prescriber

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PAGE POINTS

1 In the UK, government policies such as the NHS Plan have particularly focused on improving the care of people with long term conditions such as diabetes.

2 A new confidential reporting system for the recording of adverse events has been launched, which will report on trends in medical errors and promote a learning culture in the NHS.

Table 1. Key factors as emphasised by the Institute of Medicine (DeLisa, 2004).

- Preventable adverse events are a leading cause of death in the USA
- Medication errors commonly occur in hospitals but are traditionally under-reported
- Two out of every hundred patients admitted to American hospitals will have experienced a preventable adverse event
- Costs at that time in respect of adverse drug events were estimated as \$4700 per patient
- Insulin was revealed as one of the top high alert medications in respect of medical error.

DeLisa (2004) also stipulates that where the error leads to an adverse event this could be construed as a preventable adverse event. Kowiatek et al (2001) also highlighted the study by the IOM (DeLisa, 2004) emphasising the key factors (Table 1). Common insulin prescribing errors identified by Kowiatek et al (2001) were as shown in Table 2.

National perspective

In the UK, government policies such as the NHS Plan (DoH, 2000) have particularly focused on improving the care of people with long term conditions such as diabetes. These policies, designed to reduce health inequalities, increase patient involvement and promote new standards of care have led to NSFs, NICE guidelines, and the formulation of the Expert Patient Programme (DoH, 2001b). As a result the issue of medical errors has become more prevalent in British journals. Vincent et al (2001) examined 1014 medical and nursing notes in two acute hospitals and revealed 10.8% of patients experienced an adverse event, about 50% of which could be deemed preventable. A third of these events led to moderate or greater disability or death. They concluded that

adverse events were a 'serious source of concern to patients and a large drain on NHS resources' (p. 517). Alberti (2001) advocates the setting up of a national system for recording of adverse events, highlighting some of the significant causes of error as due to:

- medical staff fatigue
- systems failure
- operative error
- drugs.

A new confidential reporting system for the recording of adverse events has since been launched (Katikireddi, 2004), which will report on trends in medical errors and promote a learning culture in the NHS.

Local perspective

Patient's verbal complaints, assessments of referred inpatients, care and an increasing number of completed adverse events forms led to a process whereby all adverse events relating to care were recorded by the inpatient DSN over a 7-month period in the author's trust.

Areas for concern which the team felt constituted an adverse event are shown in Table 3; these events recorded over a six month period are shown in Figure 1.

The results in Figure 1 relate only to

Table 2. Common insulin prescribing errors identified by Kowiatek (2001).

- Ten-fold overdoses due to the abbreviation 'u' used instead of 'units'
- Administration of the wrong type of insulin
- Incorrect intravenous infusion rates
- Administration to the wrong patient
- Administration of insulin instead of heparin
- Duplicate orders.

Table 3. Areas for concern which constituted an adverse event.

- Persistent hypoglycaemia
- Unsigned drug/insulin charts (poor prescribing)
- Omission of insulin/oral hypoglycaemic agents
- Errors with sliding scale regimens
- Incorrect name of insulin prescribed
- No dose titration in relation to poor glycaemic control
- Extra insulin given in response to single high blood pressure event.

people with diabetes referred to the inpatient DSN and therefore are only indicative of the whole problem. Some people were affected by two prescribing errors; for example, if a dose of insulin was omitted following hypoglycaemia, the patient may have been given an extra dose of short acting insulin because his/her blood glucose had risen to over 20 mmol/l later in the day. There was reluctance, as in most trusts, for staff to report adverse events or medical errors (Cook et al, 2004). *Figure 1* shows clearly when the DSN was on annual leave (July to early August) and it should be noted that in early August the junior doctors' new rotation began.

The number and type of event are shown in *Figure 2*. These figures reflect the initial findings of the Audit

Commission (2000) and Hiscock et al (2001).

Prescribing errors: Why do they occur and who takes responsibility for them?

A recent American report (Landrigan et al, 2004) demonstrated that a reduction in junior doctors' working hours significantly reduced medical errors. Local data, however, strongly indicate that more doctors prescribing for each individual leads to less continuity of care and it may be surmised that this could offer more room for error. The reduction of junior doctors' working hours locally certainly seems to have impacted on the number of errors. *Figure 3* shows the prescribing pattern for two people with diabetes over a 3-week

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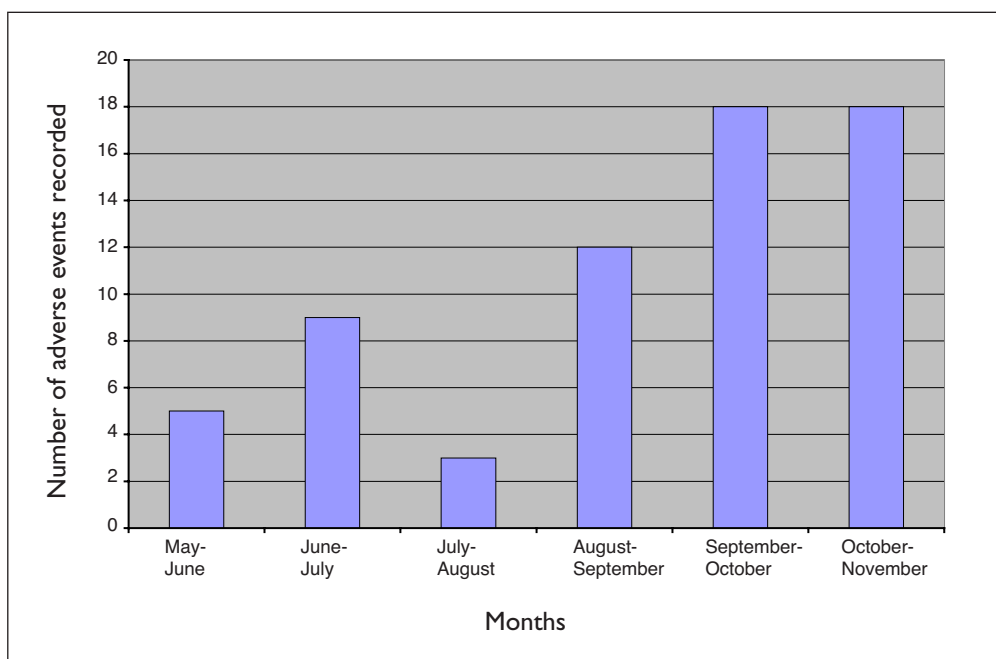


Figure 1. Number of adverse events recorded on a monthly basis from 18.05.2004 to 18.11.2004.

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1 Lack of knowledge around diabetes and insulin types was found to play a major part in this study.

2 Nurses caring for patients would recognise poor prescribing and ensure that insulin was correctly prescribed.

3 Ninety-six per cent of nurses and more than 90% of pharmacists, physicians and administrators in a referenced study assigned the main responsibility for patient safety to nurses.

4 Increases in nursing staff in areas where people with diabetes are admitted is needed.

5 A multidisciplinary approach to care with doctors, nurses and pharmacists forming ad-hoc teams working cohesively for the care of the person with diabetes is necessary.

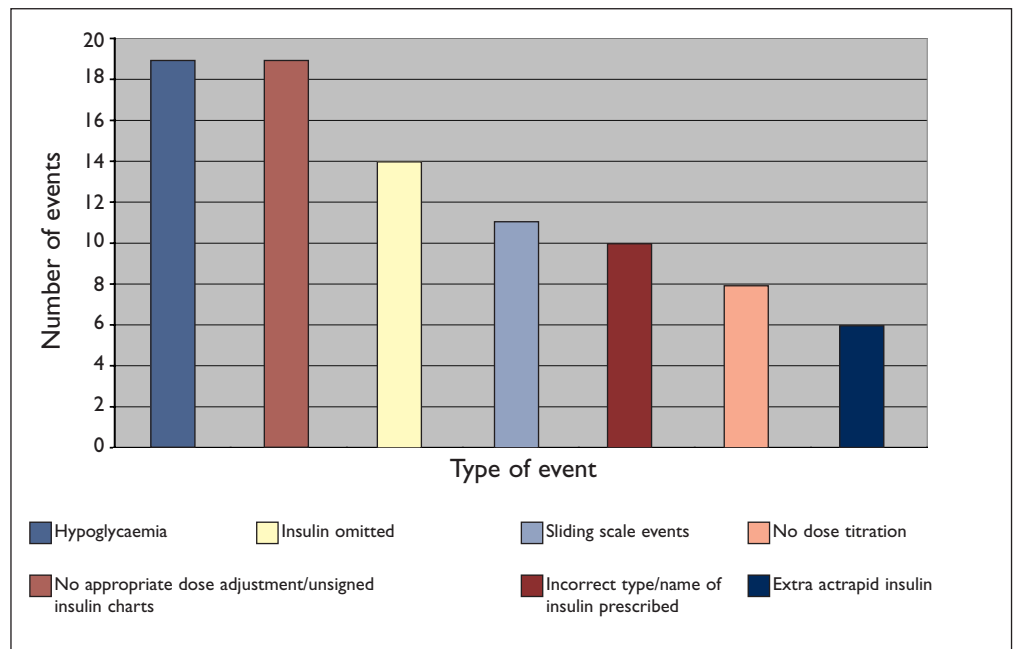


Figure 2. Types and frequencies of prescribing errors.

period where a total of nine different doctors prescribed for each individual.

Lack of knowledge around diabetes and insulin types was found to play a major part in this study. Often only part of an insulin name was prescribed; for example one patient who was normally treated with Humulin M5 was prescribed Humulin Mix, Humulin, and then Humulin M5 during admission. It appears that if one doctor wrote the incorrect name subsequent doctors followed the pattern. Another patient was written up for ‘Novo Nordisk’ three times a day as part of the patient’s basal bolus regimen.

It may be argued that the nurses caring for these patients would recognise such poor prescribing and ensure that insulin was correctly prescribed. According to a 3 year study into patient safety in 29 hospitals in nine American states (Cook et al, 2004) the two most common prescribing errors were due to: medication, wrong patient, dose, time, drug, or mode of delivery; or illegible prescription writing.

Of those questioned in the Landrigan et al (2004) study, 96% of nurses and more than 90% of pharmacists, physicians and administrators in their study assigned the main responsibility for patient safety to nurses. This study recognised that despite this there was

reluctance on the part of the nurses to question physician’s clinical judgment or to take action to ensure the correction of errors. The authors felt that this could be related to the fact that only 8% of the doctors questioned considered nurses as members of the decision-making team. Ward nurses’ lack of knowledge around diabetes also leads to reluctance on their part to engage in discussion around patient care (Heatlie, 2003). Hellman (2001) argues that the real challenge is in focusing on how to assist those actually providing care; he advocates increases in nursing staff in areas where people with diabetes are admitted. He also emphasises a multidisciplinary approach to care with doctors, nurses and pharmacists forming ad-hoc teams working cohesively for the care of the person with diabetes.

Ward based training

Training in the locality for ward based personnel in the past had been sporadic due to work load pressures on the diabetes nursing team. Non-mandatory training for diabetes link workers consisted of one or two half-day sessions and attendance was poor.

Specific local diabetes training for junior medical personnel was also problematical because frequent post

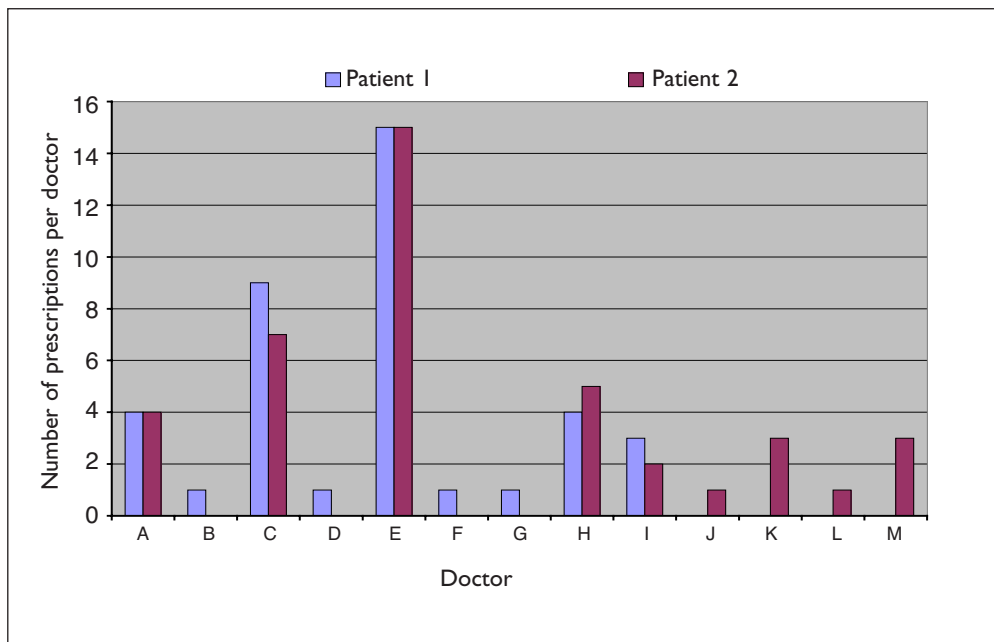


Figure 3. Prescribing track record of doctors for two people with diabetes over a 3-week period.

changes and shift patterns made it difficult for personnel to attend teaching sessions. Further medical training in diabetes is advocated by Conn et al (2003) who found that short, one-hour, educational sessions with junior doctors resulted in improvements in both diabetes management and confidence in the junior doctors caring for insulin-treated people. Ward based teaching for medical staff could be said to address these issues but this would have implications in terms of service planning.

New strategies to improve patient care

Partnership working is required to improve the quality of insulin prescribing; this includes DSNs, the nurse prescriber, ward based medical and nursing staff, and people with diabetes.

Diabetes specialist nurse involvement

In this country DSNs are taking on new roles which may impact on inpatient care. The inpatient DSN role recommended by the NSF (Standard 8, DoH, 2001a; DoH, 2001c) was shown to reduce length of stay and improve patient and staff knowledge of diabetes and patient satisfaction. This

recommendation did not include ring fenced monies for such posts. Davies et al (2001) suggest that costs for this role could be offset by cost reductions associated with reduced length of stay. Winocour et al (2002a), however, highlight the shortage of DSNs, 90% of whom work within both primary and secondary care, and that previous bids for inpatient posts have been unsuccessful. They also raise concerns around secondary care provision since the 'shifting the balance of power' initiative (DoH, 2002a) which gave responsibility for all funding to primary care trusts (PCTs) who will determine service priorities (Winocour et al 2002b).

The nurse prescriber and partnership working with ward based staff

The extended nurse prescriber based in secondary care may take more responsibility for inpatient prescribing. Much of diabetes prescribing takes place under the supplementary prescribing process (DoH, 2003). This leads to greater partnership and responsibility for care between the patient, independent prescriber (the doctor) and supplementary prescriber (the nurse). It

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2 The cost of a new inpatient DSN role could be offset by cost reductions associated with reduced length of stay.

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1 New roles for nurses have not been welcomed by all health professionals, especially in the light of reducing doctors' hours.

2 A self-management approach to diabetes is stipulated in the NSF for diabetes but people with diabetes need to be confident about managing their diabetes in order to feel empowered.

3 The diabetes nursing team (PCT employed) worked together with the consultant diabetologist and head of nursing through the local NSF steering group to formulate strategies to improve the care of inpatients.

4 Whilst emphasising the key principles of effective care for people with diabetes admitted to hospital the DoH fails to give adequate guidance on how such changes can be implemented with no protected finance.

also affords greater opportunities for both health professional and ward based education (Cradock, 2004). It is important to emphasise that in the authors' experience the role of the nurse prescriber seeks to give additional support for ward based staff, to 'up-skill' rather than 'de-skill'. New roles for nurses, however, have not been welcomed by all health professionals, especially in the light of reducing doctors' hours. Some embrace extended roles (Crouch, 2003), while others maintain that nurses undertaking more advanced roles should have those extra responsibilities reflected in their pay and cast doubt on whether this will occur through the Agenda for Change process (Duffin, 2002).

Patient involvement

A self-management approach to diabetes is stipulated in the NSF for diabetes (DoH, 2001a) but people with diabetes need to be confident about managing their diabetes in order to feel empowered, especially in the hospital setting where care is traditionally the responsibility of the doctor (DeFronzo et al, 2004). Diabetes UK through patient literature, such as *What care to expect in hospital* (British Diabetic Association, 1996), encourages people with diabetes to take more control over their inpatient care (Burden, 2002). Patients may be reluctant to report errors, but through systems such as the Patients Advocacy Liaison Service (PALS) they will be encouraged to report issues in order to promote a culture whereby staff can learn by mistakes (DoH, 2002b).

Local initiatives to reduce prescribing errors and adverse events

As a direct result of the adverse event audit and in line with NSF recommendations, the PCT has designated a DSN to secondary care. The diabetes nursing team (PCT employed) also worked together with the consultant diabetologist and head of nursing (Acute Trust) through the local NSF steering group to formulate

strategies to improve the care of inpatients with diabetes. These include:

- Mandatory training arranged for diabetes link workers for 3 half-days per year.
- Increased provision of diabetes education incorporated into the student nurse training programme.
- Extended nurse/supplementary prescribing incorporated into the ward setting.
- Medical staff are to receive additional 30 minutes diabetes training per year covering insulin prescribing.
- Modern matrons and ward pharmacists to be more aware of ward based prescribing errors and conduct regular ward audits in this respect.
- All staff are to be encouraged to report prescribing errors or adverse events within a blame free culture.

Conclusion

The DoH, through changes in government policy leading up to the NSF, sets a mammoth task for both the diabetes team and the inpatient DSN. While emphasising the key principles of effective care for people with diabetes admitted to hospital it fails to give adequate guidance on how such changes can be implemented with no protected finance.

Prescribing errors relating to diabetes inpatient care both locally and nationally are common and often preventable. Nurse prescribing could be the key to both improved patient satisfaction and safe prescribing, but the evidence remains to be seen. What is clear is that such errors affect patient care, experience, and length of stay; they have a major impact on the cost of inpatient care and must influence waiting times for admission.

Responsibility for reducing errors appears to have been put firmly into the hands of nurses and other allied health professionals; however, it will need a multidisciplinary approach to make significant improvements. In light of the rate of prescribing errors locally it is apparent that current medical and nurse training for hospital staff is inadequate but steps have been taken to address this shortfall. People

with diabetes are becoming more vocal about care, patients' expectations and their knowledge of diabetes management will ultimately influence service delivery. There is a responsibility for diabetes teams to ensure that patients are adequately educated so that when admitted to hospital they feel confident to either self-manage or influence diabetes management. There is reluctance in some UK trusts to employ inpatient DSNs, however, the cost to trusts could effectively be met through the reduction in length of stay. Work undertaken locally by the Acute Trust and the PCT demonstrates that despite concerns around secondary care provision since the 'shifting the balance of power' initiative, the welfare of patients can override cross-boundary differences. ■

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2 There is reluctance in some UK trusts to employ inpatient DSNs however the cost to trusts could effectively be met through the reduction in length of stay.