

# Delivering a diabetes inpatient specialist nursing service: The Aintree experience

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## Article points

1. There number of people who have diabetes being admitted to hospital is increasing.
2. Having a diabetes inpatient specialist nurse (DISN) service can help reduce length of stay in hospital for patients with diabetes.
3. The DISN has an important role in patient education.
4. Only about half of UK hospitals have a DISN service.

## Key words

- Diabetes inpatient specialist nurse
- Inpatient care
- Patient education
- Referral

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There are approximately 2.6 million people with diabetes in the UK, with the number expected to rise to over 4 million by 2025 (Diabetes UK, 2010a). As this number increases, it is inevitable that the burden on the NHS will also increase, resulting in more people with diabetes being admitted to hospital. This article describes the workload of the diabetes inpatient specialist nurse team at Aintree University Hospital over a 6-month period. The authors discuss reasons for referral to this service, and evaluate the benefits of having a dedicated inpatient diabetes service. The authors conclude that such a service should be available routinely within all UK hospitals.

About 10% of all hospital beds in the UK are occupied by people with diabetes, increasing to 20–25% for high-risk groups. People with diabetes are twice as likely to be admitted to hospital, and often stay for longer, regardless of the cause of admission. This increased length of stay is likely to be related to the degree of unstable glycaemic control during their hospital stay (National Diabetes Support Team [NDST], 2008). Moreover, increased length of hospital stay results in cost implications for NHS trusts (Diabetes UK, 2010a).

Poor quality of inpatient diabetes care has been documented as an area of concern by patients (Audit Commission, 2000). Being a hospital inpatient can have a significant impact on people with diabetes, and evidence shows that these people are unhappy about the management

of their diabetes in hospital. For example, areas for concern include losing control of their insulin treatment, timing and quality of meals, inadequate blood glucose monitoring and overall lack of control of their condition (NDST, 2008).

## History of diabetes inpatient specialist nurses

In 2003 the Department of Health (DH) published the National Service Framework for diabetes (DH, 2003). Standards 7 and 8 refer to the importance of adequate and effective hospital care for inpatients with diabetes. In the subsequent 4 years since publication of this document, the number of diabetes inpatient specialist nurses (DISNs) has gradually risen with 100 new posts being created. However, there is variation and gaps throughout the UK,

and only about half of UK hospitals have a dedicated DISN service (Sampson et al, 2007). More recently, Gosden et al (2010) identified that 41% of DSNs were looking after inpatients with diabetes.

### Evidence for DISNs

It has been well documented that a DISN service can help reduce the length of hospital stay for people with diabetes (Cavan et al, 2001; Davies et al, 2001; Sampson et al, 2006). There is also evidence that non-medical prescribing for inpatients can help reduce length of hospital stay (James, 2006; Courtney et al, 2007).

### Case study: Aintree University Hospitals NHS Foundation Trust

Aintree University Hospitals NHS Foundation Trust is a large, complex organisation, providing acute health care to a population of 330 000 in North Merseyside and surrounding areas. The immediate catchment area is largely urban with significant areas of commerce, including docklands. The trust provides acute hospital services to the residents of South Sefton, North Liverpool and Kirkby. It is also a teaching hospital for the University of Liverpool, and a tertiary centre providing specialist services to a much wider population of around 1.5 million people in Merseyside, Cheshire, South Lancashire and North Wales. The population served by Aintree includes some of the most socially deprived communities in the country, with high levels of illness creating a high demand for hospital-based care (Aintree University Hospitals NHS Foundation Trust, 2008).

Over the last two decades, the trust has seen an increase in the prevalence of inpatients with diabetes (see *Figure 1*), from 7.1% in 1990 to 16.4% in 2009 (Masson et al, 1992; Wallymahmed et al, 2005; Aintree University Hospitals NHS Trust, 2009).

The trust currently comprises two hospitals on separate sites, which are due to merge later this year. Aintree University Hospital provides emergency care and a wide range of acute and non-acute specialties, while Walton Hospital houses the diabetes centre and provides outpatient and day-surgery services.

### Structure of the diabetes nursing team

Due to the problem of working across two sites, the diabetes nursing team is split into an inpatient team and an outpatient team, although crossover is provided to cover sickness and annual leave. The team is led by a nurse consultant who works across both sites. The DISN service is based at Aintree University Hospital, with the rest of the diabetes nursing team based at Walton Hospital.

The outpatient team based at Walton Hospital includes 2.4 whole time equivalent (WTE) DSNs (band 7), and 1.4 WTE diabetes nurse educators (band 6).

The inpatient team based at Aintree University Hospital consists of 0.8 WTE DISNs (band 7), 1.0 WTE diabetes nurse educator, and one weekly session from the diabetes nurse consultant. Medical support is provided by the diabetes specialist registrar (SpR) and/or consultant on call, however they are only contacted as needed rather than routinely on a daily basis.

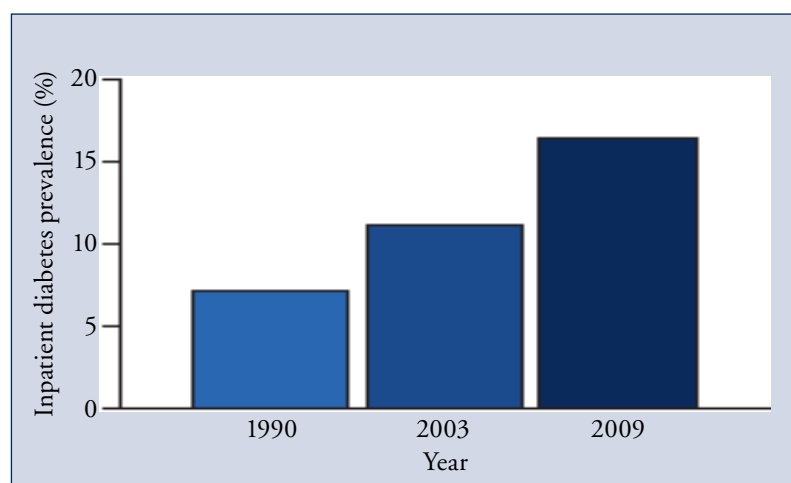
### Role of the DISN

In total, the DISN team provides a service for over 1000 hospital beds. The role of the DISN is divided into four main areas:

- Clinical care.
- Education.
- Developing guidelines.
- Administration/organisation.

### Page points

1. It has been well documented that availability of a diabetes inpatient specialist nurse (DISN) service can help reduce the length of hospital stay for people with diabetes.
2. The DISN service is based at Aintree University Hospital, with the rest of the diabetes nursing team based at Walton Hospital.
3. The outpatient team based at Walton Hospital includes 2.4 whole time equivalent (WTE) DSNs (band 7), and 1.4 WTE diabetes nurse educators (band 6).



*Figure 1. Prevalence of inpatients with diabetes at Aintree University Hospital 1990–2009 (Aintree University Hospitals NHS Foundation Trust, 2009).*

### Page points

1. Referrals are received via a bleep system, and a written *pro forma* is completed for every patient seen or telephone advice given. Most referrals are from the ward nursing staff following requests from the medical staff, with some medical staff referring directly.
2. The diabetes inpatient specialist nurse (DISN) team typically carries out between 60 and 70 reviews per week, the majority of which are face-to-face contacts, with some telephone advice.
3. An important role of the DISN is the development of Trust policy and guidelines, and the DISN team is currently involved in the development of guidelines for the management of steroid-induced hyperglycaemia.
4. During a 6-month period – between June and November 2009 – the DISNs reviewed 400 patients at Aintree University Hospital alone (excluding those referred from other NHS Trusts on site). This involved 944 face-to-face contacts and 225 phone contacts.

### Clinical care

Referrals are received via a bleep system, and a written *pro forma* is completed for every patient seen or telephone advice given. Most referrals are from the ward nursing staff following requests from the medical staff, with some medical staff referring directly. The main criteria for referral to the DISN service include:

- Newly diagnosed type 1 or type 2 diabetes.
- Erratic blood glucose control.
- Hyperglycaemia.
- Hypoglycaemia.
- Diabetic ketoacidosis.
- Hyperosmolar hyperglycaemic state.
- Presence of foot ulcers.
- Enteral feeding.
- Admission for surgery.

The DISN team typically carries out between 60 and 70 reviews per week, the majority of which are face-to-face contacts, with some telephone advice. In addition to inpatient consultations, the team also runs a “discharge clinic” on alternate weeks at the diabetes centre. This clinic is for patients who need specific support and review following their discharge from hospital. The DISN is also involved in the weekly antenatal/diabetes clinic based at Aintree University Hospital, working alongside the diabetes consultant and SpR.

### Developing guidelines

An important role of the DISN is the development of trust policy and guidelines, and the DISN team is currently involved in the development of guidelines for the management of steroid-induced hyperglycaemia. The DISN team is also working with the cardiac team to produce guidelines for the management of diabetes during exercise related to cardiac rehabilitation.

### Education

The role has a large educational element and the DISN team is involved in junior doctor and ward staff training, and running a link-nurse project. Ward staff training includes a rolling programme on the dedicated diabetes wards, blood glucose monitoring education, and annual updates for healthcare assistants and registered nurses. An example of the type of programmes that the

DISN team run is an upcoming session on the safe use of insulin (NHS Diabetes, 2010).

### Administration and organisation

It is essential that DISNs liaise closely with the outpatient diabetes team, community diabetes teams, GPs and practice nurses regarding patient discharges, treatment changes and appropriate follow-up of people with diabetes. However, this can be complex at times as the hospital serves patients from three different PCTs.

### Challenges faced by the DISN team

Split-site working creates practical problems for the DISN team, for example when arranging follow-up and booking patients into clinic. Likewise, if an individual well known to the outpatient team is admitted to hospital, it would be ideal if that patient could be reviewed on the ward by the DISN who knows him or her to ensure continuity of care. However, at present this is not possible, although this should be rectified when the two hospital sites merge in the near future.

A major challenge faced by the DISN team is late referrals, for example on the day of discharge. This can impact on the quality of care and length of stay as patients cannot always be seen on the same day of referral due to workload. Face-to-face contacts are preferable but this is not always possible, and problems can occur when telephone advice is given but not followed. The team is currently working with the link nurses to optimise timely referrals.

### Activity of the DISN team over a 6-month period

During a 6-month period – between June and November 2009 – the DISNs reviewed 400 patients at Aintree University Hospital alone (excluding those referred from other NHS trusts on site). This involved 944 face-to-face contacts and 225 phone contacts (see *Table 1*).

The majority of referrals came from the medical wards, followed by surgical wards and the dedicated diabetes wards. The least number of referrals came from critical care as they use their own glycaemic control protocols and patients are usually not referred until they are discharged to the wards. People with diabetes

in the accident and emergency department (A&E) and medical assessment unit may only be seen once and then discharged with the appropriate follow-up in place in order to avoid admission to hospital.

The majority of the 400 patients seen were for clinical care or management, including adjustment of insulin to achieve better glycaemic control, administration of oral hypoglycaemic agents, or for initiation of treatment (see Table 2). However, following assessment it was found that many of these patients also required ongoing education.

Of the 400 patients seen, only 25 (6.25%) were referred to the diabetes specialist registrar and consultant. Fifteen of the 400 referrals (3.75%) were initially referred to the consultant and SpR and then referred back to the DISN service. Therefore, in this 6-month period, 90% of the inpatient referrals were managed by the DISN team alone.

#### Inappropriate referrals

Of the 400 referrals received, only seven (1.75%) were considered inappropriate. In these instances the patients were either referred for education but had dementia or were confused, or patients were referred to the DISN service and were later found to have stable glucose levels.

#### Discussion

When the DISN service was originally introduced at Aintree University Hospital (Masson et al, 1992), all of the referrals came via the diabetes consultants or the then senior registrars, and most referrals were for education rather than for treatment review. The service has now evolved and the DISNs are the first point of contact for most management issues, only referring on to medical staff if there are specific problems.

Referrals specifically for patient education mainly come from the dedicated diabetes wards (on these wards glycaemic control is managed by the medical staff with referrals to the DISN only for specific educational issues). Patients with newly diagnosed diabetes outside of the diabetes wards are referred to the DISN service for management advice and education.

#### Workforce

Following a review and reorganisation of the diabetes specialist nurse service (inpatient and outpatient), there are now 1.8 WTE nurses dedicated to inpatient diabetes. However, the team provides a service not only to Aintree University Hospital but also to other NHS trusts housed on the Aintree site. One of these trusts is a regional neurosciences unit that generates a lot of often complex patients requiring frequent follow-up. The team also receives referrals from a mental health trust, which, although sporadic, can result in one single patient requiring multiple follow-up sessions. However, the DISN service has a service level agreement with both of these trusts and its activity is income-generating.

While the DISNs currently provide a service to over 1000 beds, it has recently been suggested that there should be one DISN per 300 beds (Diabetes UK, 2010b), which would mean that, for the current level of service provided by the team, there should be at least an additional 1.2 DISNs. However, in the authors' trust all specialist nursing posts are currently under review and additional resources are unlikely at the present time.

#### Page points

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3. While the diabetes inpatient specialist nurses (DISNs) currently provide a service to over 1000 beds, it has recently been suggested that there should be one DISN per 300 beds, which would mean that, for the current level of service provided by the team, there should be at least an additional 1.2 DISNs.

**Table 1. Diabetes inpatient specialist activity over a 6-month period.\***

Directorate	Patients reviewed	Face-to-face contact	Phone contact	Mean contacts (per patient)
Medicine	217	586	166	3.5
Surgery	83	203	51	3
Diabetes ward	57	86	2	1.5
MAU	26	36	3	1.5
A&E	12	13	1	1.1
Critical care	5	20	2	4.4
<b>Total</b>	<b>400</b>	<b>944</b>	<b>225</b>	

\*Data for Aintree University Hospital only; data excludes referrals from other trusts based on the Aintree site. A&E=accident and emergency department; MAU=medical assessment unit.

**Table 2. Reasons for referrals to the inpatient specialist nurse team.**

Reason for referral	Number of referrals
Hyperglycaemia	173
Hypoglycaemia	92
Education	46
Enteral feeding	36
Newly diagnosed diabetes	35
Diabetic ketoacidosis	11
Inappropriate referrals	7

*“From the data presented in this article it is clear that the diabetes inpatient specialist nursing team is managing the majority of patients referred, and reducing the need to refer patients to the medical team.”*

#### Continuity of care

The DISN team provides continuity of care and is able to review the patient as needed or write a management plan. Suggestions are made to medical staff via the management plan and the medical staff then prescribe any change to treatment. In addition, follow-up after discharge can be made in a timely and appropriate manner, including referral to the community diabetes team.

A major issue in the authors' trust has been a reluctance to implement inpatient non-medical prescribing. However, following a presentation on insulin errors at a recent Drugs and Therapeutics Committee meeting, non-medical prescribing has been introduced in the acute areas having previously only been agreed in outpatients. This will certainly add to the efficiency of the DISN service.

#### Implications for training and practice

Inpatient diabetes is an important aspect of SpR training. In the authors' trust, SpRs do not see a lot of inpatient diabetes outside of their own ward areas as the majority of referrals are dealt with by the DISN team. This has implications for the training of future diabetologists.

The DISN needs to be a senior nurse with extensive experience in diabetes care and be aware of his or her own competencies. However, for the role to function safely there needs to be easily accessible advice from senior medical staff to advise on complex patients with often acute problems. There is always a diabetes SpR or consultant on-call who can be contacted and are both easily accessible by the DISNs.

#### Conclusion

The DISN service at Aintree University Hospitals NHS Foundation Trust is a busy service. From the data presented in this article it is clear that the DISN team is managing the majority of patients referred, and reducing the need to refer patients to the medical team. However, the authors suggest that the service is under-resourced, and minimal time is available for education, training and service development. This makes it impossible to work proactively rather than reactively due to the large number of patient referrals.

With the current financial situation in the NHS the situation is unlikely to change. However, once the inpatient and the outpatient services are moved to the same site, it is hoped that better working between the two services will be achieved, thus improving the quality of care for both inpatient and outpatients with diabetes. The authors recommend that all NHS trusts should have at least one DISN. ■

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