

# Out-of-hours telephone advice service by paediatric DSNs: A business case

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## Article points

1. Children and young people with diabetes should have 24-hour access to expert help.
2. The purpose of this business case is to examine the prospects of providing a paediatric diabetes telephone advice service for acute queries outside normal working hours.
3. The telephone service would be staffed by paediatric DSNs with the aim of ensuring that appropriate intervention is instituted early to prevent clinical deterioration and hospitalisation.
4. The service could also deliver financial savings for the NHS.

## Key words

- Business case
- Clinical nurse specialist
- Out-of-hours
- Paediatrics

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Type 1 diabetes is a life-long condition that, if not properly managed, can have both short- and long-term complications. The objective of diabetes management is to optimise self-management by the person with diabetes with support from appropriately trained healthcare professionals. The purpose of this business case is to examine the prospects of providing a telephone support service outside normal working hours. Paediatric DSNs will provide telephone advice to unwell children and young people with diabetes and their parents and carers. The aim is to reduce morbidity and prevent unnecessary hospitalisation, thus improving the quality of care of these children and young people, with positive financial implications for the NHS.

Children and young people with type 1 diabetes (T1D) need a package of care (NICE, 2004) that includes insulin injections, usually several times a day; self-monitoring of blood glucose; and adjustments in insulin dose and diet according to levels of physical activity.

Poor management of T1D can result in both acute complications such as diabetic ketoacidosis (DKA) (Vanelli and Chiarelli, 2003) and hypoglycaemia (Unger and Parkin, 2011), as well as long-term micro- and macrovascular consequences such as kidney disease, heart disease, eye and foot problems (Ratzmann et al, 1989).

The number of people with diabetes of all types is predicted to increase rapidly over the coming years. The current estimate of

prevalence in the UK is one in 700–1000 children, yielding a total population with T1D aged <25 years of approximately 25 000 (Diabetes UK, 2010). Unfortunately, in the UK we have the both the highest number of children diagnosed with diabetes in Europe and the lowest number of children attaining good diabetes control (Department of Health Diabetes Policy Team [DHDPT], 2007). Thus, the magnitude of the burden of the disorder cannot be overstated.

Additionally, 30–40% of children and young people with diabetes will develop microalbuminuria as a marker for developing kidney disease (DHDPT, 2007) and at least 25% will require laser treatment for retinopathy (Bryden et al, 2003). Life-expectancy is reduced, on average, by 23 years

in those with T1D (DHDPT, 2007). Diabetes can affect children and young people's mental health and emotional wellbeing (NHS Diabetes and Diabetes UK, 2010). There can also be consequences for social and family life (DHDPT, 2007). A high rate of hospitalisation has an adverse educational impact on young people (Delamater, 2009). Therefore, the effect on quality of life should not be underestimated.

Trials such as the DCCT (Diabetes Control and Complications Trial) have shown that good glycaemic control, as reflected in HbA<sub>1c</sub>, reduces complication rates (DCCT Research Group, 1993) and should reduce the need for hospital admissions for complications such as DKA, which is an important cause of morbidity and occasional mortality in children with T1D.

Healthcare professionals need to provide an environment in which diabetes can be jointly managed, promoting self-care and empowerment. This also includes providing access 24 hours a day, 365 days a year to emergency advice from competent staff. Home-based care with support from the local paediatric diabetes care team including 24-hour telephone access to advice is safe and as effective as inpatient management (NICE, 2004).

### Proposal

The proposal is to establish a service that provides advice through telephone consultation by paediatric DSNs (PDSNs) to children and young people with diabetes and their parents outside normal working hours.

### Rationale

The purpose of this service is to provide expert professional advice out-of-hours to unwell children and young people with diabetes. This advice would assist in their diabetes self-management to proactively reduce the possibility of clinical deterioration during that episode of illness (Diabetes UK, 2009), and by preventing DKA and hypoglycaemia avoid unnecessary hospitalisation, thus indirectly contributing to overall improvement in their

long-term glycaemic control.

Hospitalisation in children and adolescents with diabetes is associated with a high individual burden and high social costs (Gray et al, 1993; Olsson et al, 1994). In the USA, diabetes in childhood is one of the 10 leading causes of preventable hospitalisation in individuals aged under 18 years (Harms, 1994). Hospitalisation results in high expenditures, amounting to 63–80% of total direct costs for T1D (Simell et al, 1996). Reducing hospital admissions is a main goal in the structured treatment of childhood diabetes, and is a major outcome indicator in diabetes quality management (Chiarelli et al, 1998).

A study by Icks et al (2001) found that children and adolescents with diabetes in Germany had an approximately three times higher hospitalisation risk and three times more hospital days than the age-matched general population. The annual costs of hospital care for the German diabetic population aged 1–19 years amounted to 1% of all costs for hospital care in this age group. Thus, costs were largely overproportional, given that diabetes prevalence was 0.1%.

A systematic review by Angus and Waugh (2007) found that people with T1D are three times more likely to be hospitalised than those without the condition and stay in hospital twice as long. Therefore, reducing hospitalisation rates in children and young people with diabetes has significant financial consequences.

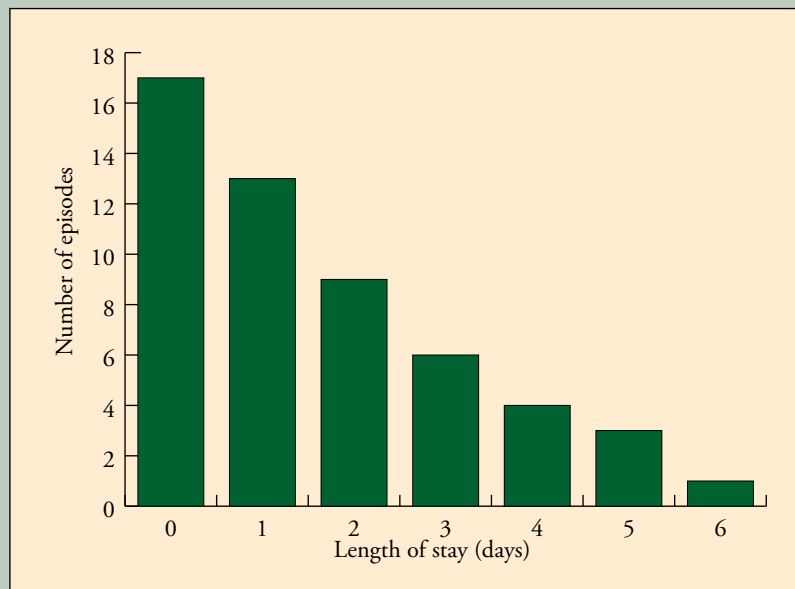
In the UK, following the introduction of a Payment by Results tariff for paediatric diabetes in 2011/12, it is anticipated that there will be a Best Practice Tariff from 2012, which will consist of an annual payment for every child and young person with diabetes. The tariff, which will be around £3500 per patient per year, will be applicable to all paediatric diabetes services.

Payment will be subject to providers satisfactorily meeting various service criteria, one of which will be the provision of 24-hour access to advice and support to young people and their families (Randall, 2011, personal communication). Thus, providing an

### Page points

1. The author proposes establishing an out-of-hours service that provides advice through phone consultation by paediatric DSNs to children and young people with diabetes and their parents.
2. The anticipated Best Practice Tariff will consist of an annual payment for every child and young person with diabetes, subject to providers meeting service criteria.
3. To claim this payment, providers will need to deliver 24-hour access to advice, so setting up an out-of-hours phone service could have significant financial benefits.

Figure 1. Length of hospital stay and number of inpatient episodes.



out-of-hours telephone advisory service not only impacts on patients' glycaemic control but also has significant financial implications for NHS trusts.

### Evidence to support proposal

There is evidence that telephone helpline services are valued by individuals with a long-term condition, their carers and healthcare professionals (Bunn et al, 2009; Brown et al, 2006). If adequately funded and planned, advice lines can be a cost-effective means of communication between specialist services, the patient and non-specialist healthcare professionals.

Evidence demonstrating the use of telephone advice lines in the management of long-term conditions include:

- Cardiology (Lindsay et al, 1995).
- Oncology (Twomey, 2000).
- Rheumatology (Hughes et al, 2002).
- Urology (Langley, 1995).
- Chronic pain (Crawley and Webster, 1998).
- Inflammatory bowel disease (Nightingale et al, 1999).

Additional research evaluating the use of such services is limited and chiefly consists of audits, or studies of patient satisfaction and preferences between staffed and answerphone

services (Brownsell and Dawson, 2002; Hughes et al, 2002; Thwaites et al, 2002). In surveys, high levels of patient satisfaction have been identified (Brownsell and Dawson, 2002).

### Local service delivery

#### Key healthcare professionals

In the author's NHS trust, the workload on the paediatric diabetic team comprises 180 children and young people with diabetes of whom 100 are under the age of 16 years and the remainder aged between 16 and 22 years. Of these 180, 26 are using continuous subcutaneous insulin pump therapy (CSII). The diabetes team comprises a paediatric consultant with expertise in diabetes and 2.5 whole time equivalent (WTE) PDSNs, of whom two are Band 6 and one part-time nurse is Band 8a.

### Trust audit

An audit at the trust showed that over a 1-year period (2010) there were 53 hospital inpatient episodes involving 33 children and young people with diabetes. Some of these had multiple admissions, particularly those with a history of poor diabetes control. *Figure 1* shows the number of inpatient episodes and length of hospital stay.

### Drivers for change

The current set-up for the provision of out-of-hours (5 pm–9 am) diabetes advice service is through the on-call paediatric registrar. Young people or their parents speak to the on-call paediatric registrar via the hospital switchboard and the registrar gives advice, either straight away or after consultation with the on-call paediatric consultant.

Paediatric registrars have a varying degree of experience in managing diabetes problems and a recent commissioners' report at the trust showed a high degree of patient dissatisfaction with this service. Young people and their parents felt that the doctor they were speaking to did not always give them the most appropriate advice and did not know the family or the family dynamics, so they did not feel comfortable in speaking to them.

The result was that young people and their parents avoided using the current out-of-hours service, which often resulted in deterioration of clinical condition to the point that hospital admission was mandated when they finally came in for assessment. Clearly, the majority of these admissions were avoidable if appropriate advice was given when concerns initially arose.

### Proposed service provision

The service will be provided by 2.5 WTE PDSNs on a weekly rolling rota. Consultant paediatricians cover the paediatric and neonatal unit at the hospital out of hours on weekdays and weekends on a 1:7 rota; and on the weekends and week days when the consultant paediatrician with interest in diabetes is on-call, the PDSNs would not need to be available for telephone advice. Also, any gaps in the PDSN rota due to leave would be covered by the consultant paediatrician with interest in diabetes without seeking financial remuneration, although the aim would be to keep such gaps to a minimum.

Any call received would be logged on a standardised proforma and the PDSNs would be referring to trust guidelines (available on the intranet) to make suitable management plans. The consistency of the advice given would be audited once the service has been up and running for 6 months. If any child needs hospitalisation, then the on-call paediatric registrar would be contacted and management plan agreed upon. Information about this service would be a part of patient and family education in clinics to avoid abuse.

### Financial aspects

The cost to the NHS for the hospitalisation of children and young people with diabetes is staggering. In 2010, a total of 86 bed days were occupied by these patients at the author's hospital. Bed occupancy costs £418 per day, so this totalled £35 948.

### Cost of providing the service

The on-call payment rate to the nurse is £11.52 for 5 pm–9 am on weekdays and £17.21 per day on weekends and bank holidays. The

**Table 1: Running costs of the telephone advice service.**

<b>Cost of paediatric DSN on-call services</b>	
Weekdays @ £11.52/day =	£24 98.19 per year
Weekends @ £17.21/day =	£1652.16 per year
Telephone costs £9.75/month =	£351 per year
(for 2.5 whole time equivalent paediatric DSNs)	
<b>Total:</b>	<b>£4501.35 per year</b>

**Table 2: Net savings achieved by the telephone advice service.**

Cost (paediatric DSN services, telephone bills)	– £4501.35
Income generated (telephone consultation)	+ £33 339.42
Bed occupancy saved:	
86 bed days @ £418/day	+ £35 948.00
<b>Net annual savings</b>	<b>£64 786.07</b>

total cost for their services on weekends and bank holidays will be £1652.16 and on week days will be £2498.19. (The days when the consultant paediatrician with interest in diabetes would be on call are excluded from this calculation). Mobile telephones cost £9.75 per month and therefore the total yearly cost for all three nurses' mobiles is £351.

The total cost incurred would therefore be £4501.35 per annum (*Table 1*).

### Tariff generated

The tariff for each 10-minute phone consultation is £22. The tariff generated for the trust by phone consultations made by PDSNs during office hours (i.e. 8-hour period) over a period of the last 3 months was £4862 (as 221 telephone contacts were made during that period). Therefore, it can be assumed that the amount generated over a period of a year would be £19 448.

If the telephone advice service is established for a 24-hour period then extrapolating the above for out-of-hours phone consultations, the additional tariff generated would be up to £33 339.42. (The days when the consultant paediatrician with interest in diabetes would be on call are excluded from this calculation).

#### Page points

1. A phone service manned by paediatric DSNs to answer diabetes-related acute queries out of hours would result in expert advice being given on appropriate management and follow-up, reducing morbidity and hospital admissions.
2. It is predicted that patient satisfaction with the diabetes service would improve.
3. A better patient experience could lead to improved engagement in self-care.

#### Net saving

The cost of running the out-of-hours phone advice service will be £4501.35 while the income generated is estimated at £33 339.42. Thus, the net income to the trust will be £28 838.07.

However, taking into consideration the potential lack of need for hospitalisation through early phone consultation and follow-up, the savings to the NHS could be £35 948 + £28 838.07 = £64 786.07 per year, if every hospital admission was avoided (*Table 2*).

#### Time scales

It is proposed that the out-of-hours phone advice service be provided initially for a period of 6 months and the outcome and usefulness evaluated. Decision about continuation of the service can be based on the evaluation outcome.

#### Evaluation techniques

The service can be evaluated by a retrospective audit which would look at the following:

- The number of out-of-hours phone calls received.
- The number of hospital admissions due to diabetes-related issues.
- The number of those admission episodes in which the phone advice service was involved.
- Patient/carer satisfaction questionnaire.

#### Optional outcomes

There are two possible options for the provision of an out-of-hours diabetes advisory service: maintain the status quo or provide a dedicated paediatric telephone advice service.

#### Maintain the status quo

Continuing to provide the current service would involve phone queries from people with diabetes or their parents getting routed to the on-call paediatric medical team who may not have sufficient expertise in dealing with complex issues in the management of diabetes-related problems, often culminating either in admission as a precautionary measure that was not really necessary; or incorrect advice being given over the phone that would result

in patients getting eventually admitted to the hospital at a later point in the course of their illness due to avoidable deterioration. In any case, the end result is increased morbidity, poor patient satisfaction and preventable expenditure to the NHS.

#### Providing dedicated out-of-hours paediatric diabetes advice service

Providing a service manned by PDSNs who would deal with phone queries from patients and carers regarding diabetes-related acute issues out of hours would result in provision of expert interpretation of the problem, advice on appropriate management and adequate follow-up, thus reducing morbidity and reducing the need for hospitalisation.

As hospitalisation is not without problems, avoiding it would be greatly beneficial for the young person and their family and it also would save the NHS an estimated £64 786.07 annually (*Table 2*).

Patient satisfaction with the local diabetes service would also improve. This would be beneficial in the long-run because improved patient engagement in self-management of their diabetes and lower HbA<sub>1c</sub> would reduce the risk of long-term complications seen in diabetes.

Providing a dedicated out-of-hours paediatric diabetes advice service is the preferred option in view of all the benefits mentioned above.

#### Conclusion

T1D is a life-long condition that is set to increase in prevalence in the coming years (Diabetes UK, 2010). Poor management of this condition increases the risks of long-term complications (Ratzmann et al, 1989). Children and young people with diabetes should have 24-hour access to expert help to deal with any problems that they may encounter during the management of their diabetes (NICE, 2004). The purpose of this aspect of service provision is to ensure that appropriate intervention is instituted early to prevent clinical deterioration and thus reduce the morbidity and mortality resulting from

this condition.

This business case proposes establishing an out-of-hours telephone advisory service led by PDSNs that would cater for the diabetes-related acute queries of children and young people with diabetes and their parents. This would ensure that timely, expert advice is given, reducing diabetes-related morbidity and improving patient satisfaction. Also, by reducing the need for hospitalisation, there would be huge financial savings for the NHS. ■

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