



**Joint British Diabetes Societies for In-Patient Care (JBDS-IP)**

**The Rowan Hillson Inpatient Safety Award 2022**

**'The Rowan Hillson Inpatient Safety Award – The best interventions: Redesigning, rebuilding and maintaining safe inpatient diabetes care during COVID'**

**How to enter:**

1. Email your completed entry to: Christine Jones, JBDS Administrator at [christine.jones@nnuh.nhs.uk](mailto:christine.jones@nnuh.nhs.uk)

**All entries must be emailed by 28<sup>th</sup> February 2022**

2. Please submit any supplementary materials to support your initiative, as these will be considered as part of the judging process.
3. **Please note this competition is only for projects undertaken during the COVID pandemic.**

**Your contact details:** [Adrian.li@nhs.net](mailto:Adrian.li@nhs.net)

**Name:** Dr Adrian Li

**Trust name and address where work was undertaken:**

King's College Hospital NHS Foundation Trust  
Denmark Hill  
London  
SE5 9RS

**Additional contributors:**

Dr Sophie Harris, Consultant Diabetologist, Supervision of implementation  
Dr Omar Mustafa, Consultant Diabetologist, Supervision of project  
Ms Ermioni Gkogkosi, Diabetes specialist nurse and nursing project lead  
Ms Georgia Noble-Bell, Lead inpatient diabetes specialist nurse  
Ms Cheryl Stewart, Service Manager, Diabetes, Endocrinology, PIU, Allergy & Immunology (Denmark Hill)  
Ms Anna Hodgkinson, Consultant pharmacist diabetes and Lambeth Diabetes Intermediate Care Team implementer  
Ms Caroline Rook, Diabetes Specialist Nurse and Lambeth Diabetes Intermediate Care Team implementer  
Dr Stephanie Russ, Lead evaluator  
Mr Don Shenker, Commissioning Lead, South East London CCG

Mr Ken Tait, Hypnotherapist, Psychotherapist, Mentor, Management Consultant Chair  
Diabetes UK-Bromley

**No conflicts of interests for all contributors**

**Additional acknowledgements:**

Dr Raisa Minhas, Senior Clinical Fellow Diabetes  
Diabetes specialist nursing team: Kaylee Lovie, Helen Rogers, Emma Whyte, Elvira Llaneza,  
Malcolm Bennison, Comfort Bright-Davies, Akunna Akpe, Jincy Rajan  
Diabetes technicians: Olga Eliseeva, Claire Scoresby-Barrow

**Title of entry (20 words maximum) – 19 words**

Remote blood glucose monitoring as a means to facilitate admission avoidance and safe early discharges during the COVID-19 pandemic

**Brief summary of entry – 186 words**

Provide a short summary of your initiative in **no more than 200 words (The box will expand)**

The COVID-19 pandemic created a need more than ever, to facilitate admission avoidance and safe early discharges. In addition, rapid treatment escalations but equally important de-escalation along with changes to clinical status caused unpredictability with management of dysglycaemia. DBm-Health is a remote blood glucose monitoring initiative, which helped to address the above by allowing the inpatient diabetes specialist team to remotely review and analyse glucose data using an online dashboard and advise patients either through in-platform messaging or telephone consultation.

The pilot, which received funding from NHS England, also brings secondary and intermediate care teams closer together, with the aim of onboarding four diabetes care providers onto a single shared platform. This enables more prompt optimisation and smoother transition between services. Thus far, two providers have onboarded with a third set to onboard in March 2022.

The latest data is hugely promising. Not only has DBm-Health demonstrated a statistically significant improvement in HbA1c at three months following onboarding, compared to traditional follow-up methods pre-COVID-19, the demographics of the cohort onboarded show that the project is tackling health inequalities, by engaging with parity across all demographic groups.

**Background/Situation analysis/Innovation (300 words maximum) – 299 words**

Briefly provide the background and rationale for the initiative. From this the judges should be able to understand why there was a need for the initiative to be undertaken. Explain what makes your initiative innovative or pioneering.

At the peak of the second wave, dexamethasone became widely initiated in the treatment of COVID-19 pneumonitis. This culminated in a wave of steroid-induced hyperglycaemia in both patients with and without diabetes. The inpatient diabetes team were overrun with cases involving COVID-19 infection, which accounted for over 90% of referrals. Many referrals

sought to facilitate safe discharges as soon as medically possible and it was difficult to predict how a patient would respond once steroids were discontinued.

At King's College Hospital NHS Foundation Trust, several initiatives were designed to help the inpatient care model cope with the changes in numbers and complexity of patients during the inpatient phase. These included adopting and adapting national COVID-19 diabetes guidance, COVID-19 electronic prescribing bundles and a dedicated protocol for insulin dosing to counter steroid induced hyperglycaemia. However, the safe de-escalation of care and follow-up of these patients remained challenging.

The inpatient team had to manage increasing workload, with local data reporting a rise in inpatients with diabetes from 21% (NaDIA) to about 40%, in addition to staff shortages due to redeployment or sickness. Changes to patients' clinical conditions highlighted a need to establish closer working relations with diabetes intermediate care teams who stepped in to assist with the follow-up management and devise safe transition of care strategies.

DBm-Health is a remote blood glucose monitoring initiative, which uses Near Field Communication (NFC) to connect wireless glucose meters with smartphone app technology via Bluetooth. Glucose measurements are immediately uploaded, which can then be reviewed remotely by the inpatient diabetes team. Uniquely, patients were being onboarded whilst they remained an inpatient or during an ambulatory care admission, many of whom began using the technology prior to their discharge. This supported their safe exit from hospital but also allowed for immediate troubleshooting of any technical problems.

#### **Objectives (200 words maximum) – 172 words**

State clearly the objectives of the initiative(s).

- 1) Facilitate early hospital discharges, admission avoidance and seamless transfer of care. It does this by allowing patients with hyperglycaemia or hypoglycaemia, which may be part of suboptimally controlled pre-existing diabetes, newly diagnosed diabetes or steroid-induced hyperglycaemia to be safely monitored remotely. Titrations of medications can then easily be done with the patient at home, which is particularly useful during self-isolation and allows for active titration as the clinical situation changes, such as with steroid-weaning. It has readied the inpatient team for any potential further wave.
- 2) Bring secondary and intermediate care teams closer together. The Lambeth Diabetes Intermediate Care Team have already onboarded the platform. This allows patient care to be transferred safely between the teams, with each team able to visualise how a patient's diabetes has progressed over time and avoid having to start from scratch.
- 3) Address the digital divide that exists within society by empowering patients who may be of older age or from BAME groups, as well as improving access for patients with T2DM to technological advances.

#### **Project plan/methods (400 words maximum) – 269 words**

Please outline the method (s) you used to achieve your objectives. The judges will also be looking for a clear rationale for your method(s).

The DBm-Health pilot received £188,500 investment from NHS England to launch initially at King's College Hospital NHS Foundation Trust. The project received trust authorisation and holds monthly steering group meetings with South East London Clinical Commissioning Group (CCG) and industry.

The inpatient team identified and onboarded appropriate patients onto the platform. They would then follow up these patients using the platform's messaging ability or calling where indicated, for example if a dose change was required or when the patient utilised the callback request feature. The diabetes technician contacted patients who appeared not to be using the app, to help troubleshoot technical queries where applicable.

The inpatient team collected data from patients onboarded prospectively. This includes demographic information, admission data, and HbA1c at checkpoints within a twelve month timeline: point of onboarding, three months, six months and twelve months.

The initiative aims to evaluate clinical outcomes, in particular HbA1c but also to obtain experiences from patients and clinicians. As a measure of success, patients onboarded onto DBm-Health had baseline and 3 month HbA1c values checked. The comparator group were selected from data retrieved from the hospital data intelligence unit, which looked at non-pregnant adults with T2DM presenting to the hospital with dysglycaemia prior to the COVID pandemic in 2017-2018. The HbA1c values were then compared between the two groups. Data of the DBm-Health group were collected prospectively by the inpatient team.

Patient experience was explored through surveys, which were sent to DBm-Health users and staff via the platform's messaging system. We are planning a focus group for qualitative data analysis to further understand their experience and help develop the platform.

### **Evaluation and results (400 words maximum) – 267 words**

Use this section to report the results and demonstrate how you measured the success of your initiative/project.

Since the pilot began, 100 patients have been onboarded; 83 from King's College Hospital and a further 17 patients have been added to the platform from the community. All patients required insulin starts.

#### Demographics:

- 60% of users are male
- 39% of users are over the age of 55
- The majority (58%) of users are from Black and Minority Ethnic groups
- 80% of users had a diagnosis of T2DM

Objective evaluation of HbA1c at three months' post-initiation compared to admission parameters have demonstrated statistically significant improvements in HbA1c for those onboarded to DBm-Health: baseline 12.3% (110.9mmol/mol) down to 7.5% (60mmol/mol) at three months. The comparator group (n=65) did not show equivalent statistical

improvement in HbA1cs at three months: baseline 10.9% (96mmol/mol) down to 10.5% (91mmol/mol).

There have been to date, no recorded re-admissions due to diabetes-related problems from those onboarded to DBm-Health.

Analytics into length-of-stay and hypoglycaemia are ongoing and in progress.

Patient survey responses have demonstrated high satisfaction using the the platform (96%). 86% agreed it was easy to use; 82% agreed it fitted with their lifestyle and 89% felt that using the app reassured them their blood glucose levels were being monitored safely. Nearly half of patients (43%) have utilised the callback function to obtain input from the diabetes specialist team the next working day. Clinicians have also welcomed the use of DBm-health: all surveyed agreed that DBm-health was an improvement on the former non-remote system and that it is easy to use; 89% agreed that it improves the interaction between patients and clinicians and that it has reduced the amount of time spent gathering data.

#### **Impact (300 words maximum) – 205 words**

Describe the impact of the initiative(s) for inpatients with diabetes and how this was measured.

The clinical impact has been significant with an average reduction in HbA1c by three-months of 4.8% (50.9mmol/mol) compared to 0.4% (5mmol/mol) in the comparator group. Patients have been onboarded directly in A&E and Ambulatory Care Units, leading to admission avoidance. Additionally, patients have been onboarded during their inpatient stay, allowing medical teams to discharge them safely at the point of medical stability. No recorded readmissions to date along with positive patient feedback shows that patients from diverse backgrounds are both able to and positive about managing their glucose levels remotely using this digital support tool.

The uncertainty with developments during the pandemic have made planning challenging. The launch of DBm-Health proved useful, certainly from a patient perspective with patients feeling reassured about their diabetes care. The clinician surveys have reported on time-saving measures in retrieval of glucose data and subsequent improvements in user-friendly interfaces for virtual-based consultations.

Costs saved, though not measured with official metrics have occurred through time saved with more efficient follow-up consultations and in future, the aim is to recognise the output or activity generated through the platform . The significant improvements in HbA1c should not be overlooked and would account for gains in quality-adjusted life years (QALYs) and discounted per-patient costs.

#### **Adaptability, Cost and Sustainability (300 words maximum) – 236 words**

How easily could your initiative(s) be adapted to other hospital Trusts? Please state whether any other Trust(s) has adapted your initiative(s) and/or any steps you have taken to promote wider dissemination of your initiative(s).

Please demonstrate the sustainability of your initiative(s). Include the cost incurred and the source of funding i.e. acute trust or CCG or any other means. Describe the process by which the funding has been sought and the challenges experienced.

DBm-Health utilises an online web-based platform. The mobile phone app runs on Android and iOS operating systems and links to wireless Agamatrix jazz meters which are of low acquisition cost and on most CCG formularies. Data governance rules apply nationally albeit with local variation. With smartphone penetration rates nearing 80% in the UK, the features described ease adaptation across the health network.

The project has also demonstrated adaptability with patients, through recognition of other groups that would benefit, including patients on haemodialysis and patients who require steroids within other specialities, such as haematology and oncology.

Training to use the platform is simple, particularly where the GDM-Health platform is utilised in the management of pregnant women due to interface similarities and the onboarding process can be done within ten minutes. With the flux in staff personnel, there have been no challenges with training new staff to become fluent with DBm-Health.

The project has been presented to the the South East London CCG, which was positively received. The ongoing feedback from staff and patients have been taken into account and iterative changes have been made to the platform in collaboration with the industry partner to improve usability and efficiency further; for example, additional columns within the display to indicate adherence to monitoring. Sustainability will depend ultimately on cost negotiation, but clinical efficacy is demonstrated and the platform has become well embedded into the practice of the inpatient team.

#### **Learning (300 words maximum) – 260 words**

One of the main aims of the competition is to enable learning and sharing of initiatives for the benefit of inpatients with diabetes. Use this section to outline any learning(s) that can be taken from the initiative(s) and/or challenges faced along the way that could be transferred to other Trusts looking at introducing similar initiatives.

The pilot has demonstrated a significant degree of usability. The platform has uniquely allowed the inpatient team to continue surveillance across a whole population of patients and specifically target those who required assistance/changes in care until their care can be safely handed over.

Time spent onboarding patients is offset by time-saved down the line through daily activities of the inpatient diabetes specialist team. The system has consequently enabled more efficient allocation of finite resources and more effective case prioritisation, to recognise early, the patients who may require more input. Subsequent time saved with patients who are stable and doing well can subsequently be distributed towards patients who may have more difficulty with managing their diabetes.

Our experience with the project has brought to the forefront interesting issues with data sharing and governance that are not always immediately obvious. For example, with how such a platform differs from accessing a GP record for a patient. The time spent onboarding patients and problems with WiFi and connectivity within the hospital have also highlighted a need for in-hospital technologies to upgrade.

Additionally, the project has demonstrated an ability to bridge the digital divide, by showing engagement amongst older patients and those from ethnic minority groups. There is as well, the bridge to engage patients with T2DM, who often remain overlooked and excluded from novel diabetes technologies.

The close teamwork and diligence of the inpatient diabetes team and intermediate care teams have been integral to the implementation and evaluation and the project has demonstrated what can be achieved together, even during exceptionally challenging times.

### **Feedback from staff and patients (300 words maximum) – 149 words**

Please include a summary of any patient feedback and evaluations of the initiative(s). It will be helpful if you can provide (as supporting materials) the tools used to gather this information. If available, please include summary of staff feedback to demonstrate their perspective on the initiative(s)' impact on the care of inpatients with diabetes during the COVID pandemic.

The team received 28 patient surveys.

- 96% agreed that they welcomed the use of Dbm-Health
- 86% found DBm-Health easy to use
- 89% felt that the app offered reassurance that their blood glucose was being monitored safely
- 43% of patients had used the callback request function, and of this cohort, 83% felt their problem had been resolved and 53% felt it was resolved quickly.

To date, 9 clinician surveys have been received.

- The main benefits were increased accuracy and speed of data retrieval
- Better communication with the messaging function particularly useful
- Shorter consultation lengths, which also led to higher patient satisfaction and more time available to spend on those unable to onboard DBm-Health for e.g. less technical
- Ability to track and escalate concerning patterns of suboptimal compliance and blood glucose trends

Areas for further development relating to app functionality have been fed back to the company and hospital ICT teams.

### **Supporting materials**

The judges' core assessment of your initiative will be based on this entry form. However, we do recommend that you **support your entry** with relevant materials, as these will be made available to the judges and are often the deciding factor in short listing the finalists.

Supporting materials could include: IT based programmes, pamphlets, booklets, audits, events, reports, journal articles, evaluation documentation, websites etc.

Supporting materials along with your entry form should be submitted by email to [christine.jones@nnuh.nhs.uk](mailto:christine.jones@nnuh.nhs.uk).

Attached:

*Infographic*

*Flowchart/Algorithm from SOP*

*Platform/ app screenshots*

*Demographics chart*

*HbA1c chart*

### **Closing date 28<sup>th</sup> February 2022**

The winners of the Rowan Hillson Inpatient Safety Award 2022: **The best interventions: Redesigning, rebuilding and maintaining safe inpatient diabetes care during COVID** will be published on the Association of British Clinical Diabetologists (ABCD) and Diabetes UK website and will appear and be referred to in future journal articles. By submitting your entry, you will be consenting to your initiative being used for these purposes. By submitting your entry you will also be consenting to your innovation being used and adapted by other Trusts in the country.