



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

**The Rowan Hillson Inpatient Safety Award 2019  
Best Perioperative Pathway for People with Diabetes**

**How to enter:**

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

**All entries must be emailed by: 06.03.20**

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 in the last 3 years i.e. since 1.1.2016.**

**Your contact details:**

**Name:** David Burckett-St.Laurent, Anaesthetic Consultant

**Submission from: Consultants Anaesthetists and Diabetologists**

Fiona Smeeton, Cathryn Jenkins, Lisa Evans, Dana Ershaid and  
Mousumi Biswas

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

**Aneurin Bevan University Health Board**

(Comprising of Nevill Hall Hospital, Royal Gwent Hospital, Ysybyty Ystrad Fawr, St Woolos Hospital)

**Additional contributors (not in order of contribution):**

**Consultant Anaesthetists:**

Dr Alison Carling  
Dr Cathryn Jenkins  
Dr David Burckett-St.Laurent  
Dr Lisa Evans

**Consultant Diabetologists**

Dr Fiona Smeeton  
Dr Mousumi Biswas  
Dr Dana Ershaid

**Diabetes Nurses**

Sr Sian Bodman - Lead  
Sr Lynn Woolway  
Sr Anita Yau  
Sr Dianne Watkins

**Pre-Assessment Clinic Nurse NHH**

Sarah West - General Surgery Lead  
Julie Tobin - General Surgery  
Linda Davey Orthopaedic Lead

**Pre-Assessment Clinic Nurse RGH + YYF**

Mary Tilley - Orthopaedic Lead  
Stef Young - Urology Lead  
Caroline Buckley - YYF Lead

**Recovery Nurses**

Michaela Hoare Lead NHH  
Jennifer Hawkins Lead RGH  
Marek Tomaszewski Lead RGH  
Chelsea McIntosh Lead YYF  
Ceri Alex Smith Lead SWH

**Commendable work from Trainee's**

Sam Beckett Anaesthetic Trainee ST7- Trainee Lead RGH  
Ben Sharif RGH Anaesthetic Trainee CT2 - [www.periopdiabetesplan.com](http://www.periopdiabetesplan.com)

**Title of entry (10 words maximum)**

Re-design of the Peri-operative Care Pathway for Surgical Patients with Diabetes

**Brief summary of entry**

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

The publication of the Joint British Diabetes Society Guidelines (JBDS) for Inpatient Care in 2016 highlighted shortcomings in the perioperative management of diabetic patients undergoing surgical procedures within the Aneurin Bevan Health Board. To enhance patient care, a pathway was re-designed by a cross specialty working group. Pre-operative patient assessment was standardised and where appropriate, peri-operative diabetic control was optimised. Each patient was provided with a personalised diabetes management plan generated from a drop-down menu, containing information on usual drug treatment, "pre-op/ day of surgery" diabetes medicine modification, as well as advice on hypoglycaemia management and sick day rules. All patients with HbA1c >69 mmol/mol have anaesthetic review and those suitable for pre-operative optimisation of diabetic control (Generally, elective patients, non-USC) are fast tracked for secondary care diabetes review.

New in-patient charts were produced which provided guidance on diabetes drug management, and together with the patient's individualised diabetes management plan, ensured adherence to JBDS recommendations and minimised risks associated with fasting. Time and place of admission was streamlined and made more efficient. The initiative required staff education, cultural change and was designed to facilitate patient empowerment, as individuals felt more engaged and better informed about their surgical journey.

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

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.

Prior to the JBDS peri-operative guidelines an inpatient treatment chart was in existence for people with diabetes undergoing surgery in the health board. However across the different hospital sites, utilisation was not standardised. The increasing complexity of diabetes medications and new insulins extended beyond the scope of the existing guideline. Patients undergoing surgery were usually seen the night before the planned procedure. They had not received advice on pre-operative diabetes optimisation, nor guidance on modification of diabetes medication on the day of surgery. Peri-operative plans were not consistently available for patients and ward staff, nor were there guidelines on how to manage patients undergoing surgical procedures with a secondary diagnosis of diabetes. The traditional practice of prescribing an intravenous insulin infusion was used by default, though not necessarily appropriately, resulting in unnecessary overnight admissions and prolonged length of stay. Diabetes management if found to be suboptimal, resulted in cancellation of surgery, often late in the day. Safety issues surrounding use of intravenous insulin infusions, particularly unopposed insulin infusions were of concern. Long acting insulin was not continued when VRIII was in use, leaving patients vulnerable to decompensation when VRIII were discontinued.

It became clear that the Diabetes, Surgical, Anaesthetic and Nursing teams needed to work together to find the best management solution. The recently published JBDS in-patient guidelines for the management of adults with diabetes undergoing surgery and elective procedures were subsequently used as a framework to restructure the service.

The innovation comprised a complete restructure of existing practice and required widespread cultural and organisational change, eventually resulting in major improvements in the peri-operative management of diabetes. This has allowed for optimised diabetes control, enhancements in patient education and safety, provided clearer information about medicines management in the fasting period to patients and staff, and demonstrated better clinical outcomes.

**Objectives (200 words maximum)**

State clearly the objectives of the initiative(s).

- To create a complete care pathway that would provide clear information for patients and staff on how to manage diabetes in the peri-operative period, from accessing services to optimise diabetes control, to pre-op/ day of surgery medicine modification
- Suboptimal diabetes control to be indentified by pre-admission team and referral to the diabetes multidisciplinary team in a timely fashion for optimisation.
- To up-skill pre assessment clinic (PAC) and ward staff and provide information that was readily available at the point of admission regarding diabetes management and standardise the guidance given to patients.
- To define areas where diabetes and VRIII could be managed safely.
- To avoid the unnecessary use of overnight admission and VRIII.
- To reduce cancellations
- To minimise fasting time and hence risk of hypoglycaemia by prioritising patients with diabetes as first on theatre lists.
- To promote safer use of VRIII, in particular obligate the use of glucose containing substrate and flexible dosing according to insulin sensitivity.
- To have treatment algorithms for hypoglycaemia or hyperglycaemia easily accessible
- To ensure safe transition back to usual medication or insulin and continue long acting insulin
- By pre-optimisation, reduce the risk of post-operative complications linked to poor glycaemic control

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

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 project began with clinicians interested in peri-operative diabetes management forming a working group to focus on restructuring the patient journey. This involved multiple departments and cross site working. Invitations were sent to the primary care diabetes service, pre-assessment clinic staff, anaesthetists, surgical specialties, diabetes secondary care teams, accident and emergency, ward nurses and junior doctors, theatre staff, schedulers and importantly people living with diabetes. A root cause analysis of critical incidents, safety breaches and inefficiencies was undertaken. Documentation and guidelines including the information generated for patients were agreed and established early in the process enabling planning and delivery of education prior to a pilot on one site.

Educational material disseminated to staff included posters with a traffic light referral scheme, stickers to highlight pre- assessment criteria and a Quick Reference Card to enable safe allocation of the correct inpatient chart for both scheduled and unscheduled patients. The link nurse educational programme was re-established. Education programmes involving all staff in the care process on all sites required considerable thought and flexibility to cover the majority and manage around shift work. Each site had a dedicated team leading on the introduction of the change in practice

PAC assessment documentation was designed to be nurse led but would 'flag up' the need for consultant anaesthetist review. Such review was required in cases where "target" HbA1c was high and the patient required optimisation, to generate complex treatment plans e.g. for insulin pump users or if there were patient safety concerns such as hypo unawareness or inability to self-manage medications. Documents would then be uploaded and an alert on the electronic patient record was enabled to highlight these to ward staff at the point of admission.

A "Pocket Medic" educational film was produced in ABUHB to provide patient education about surgery and diabetes through external collaboration with Diabetes Research Unit Cymru.

The diabetes multidisciplinary team began accepting "Pre- Operative Optimisation of Diabetes "(POD) referrals. Those referred were tracked on an electronic watchlist and reviewed promptly.

After a pilot of the pre- assessment plans and inpatient charts, multidisciplinary feedback was given, minor modifications made and charts were rolled out across all sites.

Clinical areas considered safe to manage VRIII were identified and bed management streamlined to enable day of surgery admission where appropriate.

A digitised dynamic peri-operative care plan is being finalised

[www.periopdiabetesplan.com](http://www.periopdiabetesplan.com)

It was agreed outcomes where data was available would be measured.

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

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

Prior to the new pathway no diabetes management plans were generated for patients now 100% of patients have a generated plan. 1000 standardised pre-assessment plans were completed by 60 different clinicians in the year April 18– April 19.

Hospital sites admitting patients for surgery include Nevill Hall (NHH), The Royal Gwent (RGH), St Woolos Hospital (SWH) and Ysbyty Ystrad Fawr (YYF). The larger two sites admitting more complex cases achieved similar results with clinically significant improvement in diabetes control.

At NHH 250 people with diabetes were seen in PAC annually, over a 2-year period, 77 had an HbA1c above 69 mmol/mol and optimisation was appropriate for 48. Improved control was achieved for 44 out of the 48. Mean HbA1c pre-optimisation was 95.5 mmol/mol (SD 13.5, SEM 2.1 95% CI +/- 89.5/97.2) and post 68.5 mmol/mol (SD 14.8, SEM 2.2, 95% CI +/- 64.3 /72.8). The mean difference in HbA1c was 27 mmol/mol ( $p < 0.001$ ) with no significant weight difference. Median time for optimisation was four months. At RGH 700 were seen in PAC and 80 were seen for optimisation. The mean HbA1c was 89.7 mmol/mol (SD 11.1 SEM 1.2, 95%CI +/- 92.1/87.2), and afterwards 68.5 mmol/mol (SD 15.3, SEM 1.7 95%CI +/- 71.9/65.1). Difference in HbA1c 21.2 mmol/mol ( $p < 0.01$ ). Weight recorded pre-optimisation mean 99.0 Kg (SD 26.7, SEM 3.2 95%CI +/- 105.2/92.8) and after 95.2Kg (SD 22.3, SEM 3.0 95% CI +/- 101.1/89.3. Difference = 3.9kg (NS).

Two patients who lost a significant amount of weight, experienced resolution of symptoms as a result and no longer required their procedure. If surgery was postponed it was for non-diabetes related reasons.

Of 48 patients seen for optimisation 38 who would have previously required overnight admission and VRIII, reduced to 8 with the new pathway i.e. 30 avoided unnecessary VRIII. Of the total number seen in PAC with diabetes in NHH over one year out of 243 patients 56 would have required VRIII based on previous guideline. The estimated 23% reduction quoted correlates with observation in clinical practice.

The limitations of drawing conclusions from DATIX incident reporting is recognised. For 2014 to 2017 there were 19 related to VRIII use in surgical patients with eight generated due to unopposed insulin, eight inappropriate stoppage of VRIII and/or failure of transition to s.c. insulin safely. In transition March 2018-2019 there were 5 incidents specific to VRIII with three being unopposed insulin and none from March 2019 to date.

**Impact (300 words maximum)**

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

The provision of a standardised assessment process prior to surgery has offered the chance for inpatients to optimise their health and diabetes control beforehand. Those suitable for optimisation achieved a significant improvement in diabetes control, with a significant reduction in mean HbA1c of 27 and 21.2 mmol/mol in both centres and where weight was reliably recorded, a mean weight loss of 4Kg . If sustained, metabolic improvements will ultimately translate into longer term health benefits for individuals, as well as evidence in favour of better surgical outcomes. Verbal feedback in clinic of the improved wellbeing was positive, though this outcome was unmeasured.

Generation of a written care plan provides more information, with clearer instruction about medicines management, reducing uncertainty, anxiety and enquiries. Overnight admission and use of unnecessary VRIII has been reduced and the admission process made more effective, reducing likelihood of cancellation. Where VRIII was necessary, a choice of insulin scale was offered according to insulin sensitivity, enabling greater chance of time in recommended glycaemic range. The chart obligates the use of a glucose containing substrate and incidents related to unopposed insulin infusions have reduced, improving safety. Continuation of long acting insulin, which was not happening previously, enables safe transition to usual insulin. Where glucose levels fall outside acceptable range, ie hyperglycaemia and hypoglycaemia, there is a clear treatment algorithm enabling prompt and informed treatment according to guidelines.

Better links between clinicians involved in a person's care has improved communication and streamlined management in complex scenarios. For example people on insulin pump therapy now have individualised care plans generated for their planned surgery.

The trickle effect of re-establishing the link nurse education programme and the focused staff education has created a better informed workforce which is for the greater good of other inpatients with diabetes.

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

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.

No extra resource was provided specifically for the restructure of the pathway for patients with diabetes. There was reorganisation and prudent use of the existing provision. For different hospital sites with distinct requirements, the care pathway had to be adaptable, transferrable and sustainable, which has already been demonstrated. Resistance to change was expected to pose challenges, but most staff embraced the pathway and acknowledged that current practice was not optimal.

Time dedicated by the diabetes team to pre-optimisation could be considered cost neutral as this constitutes routine care.

The increase of patients being operated on in satellite low acuity units with 'Drug management' as opposed to previous default to VRIII for a significant proportion, offloaded the higher acuity beds. This has enabled better resource management resulting in a decrease in both length of stay and overnight admission for VRIII.

The effect of diabetes on surgical outcomes has been shown in several studies. Associated risk reduction of improved long term control may lead to lower LOS and mortality as predicted by P. Underwood et.al Diabetes Care 35:1783-1788, 2010. We were not conducting a research study to prospectively test this hypothesis, but by reducing LOS along with the significant human and financial cost of critical incidents, morbidity and mortality, the pathway is likely to be both clinically and cost effective

Pre-assessment documents are PDF uploaded and together with new inpatient charts are printing costs only. Stickers (100 - £40) and Quick Reference Card (500 - £285).

Dedicated Peri-operative Diabetes Specialist Nurses are considered essential to the success of cultural change in order to implement pathways and policies and support staff and patients. The diabetes service had a business case for additional diabetes nurses but in a constrained funding environment, additional requests were considered to be prejudicial to the success of existing bids.

**Learning (300 words maximum)**

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.

Patients with diabetes are more likely to present for surgery and patients with poorly controlled diabetes are at significantly increased risk of poor outcomes. Adverse issues that occurred for peri-operative patients with diabetes were recognised as an important driver for change. Organisational learning came from dialogue and effective team working. It was this interaction and mapping the process of each stage in the patient journey together with collaboration, that provided a significant learning opportunity. Anaesthetists and PAC staff updating their diabetes knowledge, Diabetologists understanding the peri-operative pathway and how their patients were admitted and fasted. General nursing staff and junior doctors having a better understanding of the risks posed to patients with diabetes undergoing fasting and operative procedures. Structure and learning has improved confidence. There was also increased awareness amongst surgeons of the importance of good diabetes management for a patient's outcome.

A strategy of simplification and clarity within the peri-operative diabetes care pathway based on the JBDS-IP guidelines was important to enable safe and sustainable implementation of change. There was uncertainty about how guidelines might transfer from aspiration into the real world. The experience demonstrates that they have been prudent, effective and minimised adverse events. Offering reassurance that consensus expert opinion in this case is relevant when tried and tested in clinical practice.

Pre-operative optimisation of diabetes control and statistical improvement in mean HbA1c was in excess of expectation and highlights that a key opportunity in patient motivation has been recognised and utilised. Patients presenting for surgery with poorly controlled diabetes have a unique opportunity to have their risk quantified within the context of their surgery. At this juncture, when specialist diabetes advice is married with the patient's motivation to have surgery, impressive improvements can be made.

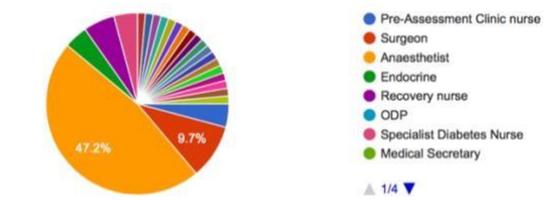
### Feedback from staff and patients (300 words maximum)

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 in relation to improved insulin and prescribing safety.

Feedback has been positive with requests to extend the use of the patient information and inpatient charts to endoscopy. In particular, the VRIII chart has been requested to be used universally across medicine and surgery. Adaptations for use in obstetrics and intensive care have been made and are the next step to updating practice and procedure in other specialties.

Survey conducted on Google Forms Feb 2020

n=81 from a widely varied multi-disciplinary group of staff across ABUHB



82% aware of the new Diabetes Peri-Operative plans

- Average Positive impact score in caring for Patients 8.4/10
- Average Positive impact score for Staff 8.5/10

86% have seen the new Diabetes Management Charts

- Average Positive impact score in caring for Patients 8.7/10

Quick Reference Diabetes Cards

- Average Positive impact score in caring for Patients 8.7/10

94% feel that the new care pathway has made care safer for peri-operative Diabetes patients

96% feel that there is more clarity on how to care for patients

Free text feedback includes:

- These are being discussed by the maternity team now and will hopefully be implemented soon. (*re: VRIII Obstetric Chart based on Universal VRIII*)
- The pre-operative management of diabetic patients was always a headache for the PAC nurses, but the diabetic plan has changed all that and has given us a clear, safe way to see our Type 1 and 2 diabetic patients through their surgery. Also, cancellations of diabetic patients have become almost non-existent, along with the number of patients needing to be admitted on the day prior to surgery.

One memorable quote from a patient

- "I feel the best I have ever felt since my diabetes control has improved"

**Supporting materials:**

1. PAC plan
  - a. NHH
  - b. RGH - Drug Management
  - c. RGH - VRIII
  - d. RGH - Instructions
  - e. ABUHB - <https://periopdiabetesplan.com>
2. Traffic light poster for referral from Anaesthetics PAC to Pre-operative Optimisation Diabetes (POD) clinic
3. Referral Sticker for PAC nurses to Anaesthetic PAC or Anaesthetic notes review
4. Pre-operative Optimisation Diabetes (POD) clinic referral letter (has now been replaced with an EPR 'e-form')
5. Pocket Medic Film <http://www.medic.video/a21-type2> in collaboration with Dr Sam Rice, Diabetes Research Unit Cymru.
6. Quick Reference Card - for scheduled and unscheduled patients
7. Quick Reference Poster - (available but not sent high Mb)
8. Drug Management Chart
9. VRIII Universal Chart
10. Simplified practice poster
11. Provisional ICU VRIII (currently being trialled)
12. Provisional Obstetric VRIII (currently in mediation)
13. Acknowledgements (staff list above)

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).

**Closing date: 06.03.2020**

The winners of the Rowan Hillson Insulin Safety Award 2017: Improving Inpatient Diabetes Safety: Best Digital Initiative will be published on the Association of British Clinical Diabetologists (ABCD), Diabetes UK and DISN UK Group websites 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.