

JBDS-IP Joint British Diabetes Societies for inpatient care

Management of adults with diabetes
undergoing surgery and elective
procedures: Improving standards

Revised September 2015



Changes in the second edition of the peri-operative document

Preoperative pathway changes

1. Box 5 (main document) now states that the BMI, BP, HbA_{1c} and eGFR should be measured in the 3 months prior to referral.
2. In the surgical outpatients section, the sentence on aims has been changed from "avoid overnight admission where possible" to "Day of surgery admission should be the 'default' position. Diabetes specific pre-admission should be avoided".
3. In the pre-operative assessment section, the following aim has been added: "Ensure a management plan is in place to prevent peri-operative dysglycaemia".
4. Appendices 1 and 2 have changed substantially:
 - a. The phrase '(Short starvation period – no more than 1 missed meal)' has been omitted to allow for the guideline to be used should a VRIII become necessary.
 - b. The dose of long acting analogue insulin has now been reduced to 80% of the usual dose until the patient is eating and drinking normally.
 - c. A new column has been added to allow usual insulin doses to be adjusted if a VRIII is to be used.
- d. The following have also been added: "*If the patient requires an ongoing VRII then the long acting background insulin should be continued but at 80% of the dose the patient usually takes when they are well. Normal insulin doses should be recommenced when the patient is eating and drinking normally".
- e. The metformin section now takes into account the eGFR, the potential use of contrast media and frequency of administration.
- f. At the pre-operative assessment clinic, all patients should have emergency treatment for hypoglycaemia written on their drug chart – i.e. Glucogel®, and 20% dextrose. Rapid acting insulin should also be prescribed".
- g. The following statement has been added: Appendices 1 and 2 have been updated since the first edition of this guideline to better reflect the understanding of the physiology and pharmacology of newer agents. There are almost no data on the use of these drugs in the peri-operative period, and as such, these recommendations are pragmatic. Units are encouraged to audit their own data and publish them.
5. In Appendix 4, the following has been added: At the pre-operative assessment clinic, all patients should have emergency treatment for hypoglycaemia written on their drug chart – i.e. Glucogel®, and 20% dextrose. Rapid acting insulin should also be prescribed.

Changes in glycaemic targets and thresholds

1. Hospitals should have clear guidelines for the management of the blood glucose when it is outside the acceptable range. Trusts should consider prescribing insulin and hypoglycaemia treatments at the time of the pre-operative assessment clinic to enable peri-operative glucose control.
2. The target blood glucose in the pre-operative, anaesthetised or sedated patient should be 6-10mmol/L (up to 12mmol/L may be acceptable). In the post-operative, awake patient, the range of 4-12mmol/L is acceptable. This change has been made because of feedback from anaesthetists who feel that in the anaesthetised or sedated patient who is unable to make others aware if they are hypoglycaemic, aiming for close to 4.0mmol/L puts them at risk of developing hypoglycaemia, and is the range recommended by ESA recently (*Eur J Anaesthesiol* 2014; **31**(10):517-573). In addition, the NICE-SUGAR data of 6024 ITU patients (who aimed for 4.5-6.0mmol/L in the intensive treatment arm) found that 82.4% of all moderate hypos (that occurred in 45% of the entire cohort) occurred in the intensive treatment arm and 93.3% of all severe hypos (that were experienced by 3.7% of the entire cohort) occurred in the intensive treatment arm. (*NEJM* 2012;367(12):1108-1118).
3. There is a new paragraph stating explicitly that it is the responsibility of the main diabetes caregivers (primary or secondary care) to optimise glycaemic control (<69mmol/mol) prior to surgical referral, and also that elective procedure should be postponed to allow this to occur.
4. In the primary care section (and throughout the document) the term 'optimise glycaemic control' has been changed to state explicitly 'aiming for an HbA_{1c} of less than 69mmol/mol'.
5. In the pre-operative assessment section 2 new action plans have been added: "Ensure that Glucogel®, glucagon and rapid acting insulin is routinely prescribed to allow prompt treatment of hypo- or hyperglycaemia in the patient who is either unconscious or unable to cooperate. The target blood glucose in the pre-operative, anaesthetised or sedated patient should be 6-10mmol/L (up to 12mmol/L may be acceptable)". And "The patients' usual diabetes medication should also be written up on the drug chart with the appropriate adjustments made (see Appendices 1 and 2)".
6. The following paragraph has been added to the section on responsibility for optimisation of glycaemic control: Local discussions will need to take place about the risks and benefits of delaying elective surgery to allow for glycaemic optimisation ("stopping the clock") and the risks of post-operative complications in those with poor peri-operative diabetes control.
7. In the Hospital admission action plan, several things have been altered: "Ensure that Glucogel®, glucagon and rapid acting insulin is routinely prescribed to allow prompt treatment of hypo- or hyperglycaemia in the patient who is either unconscious or unable to cooperate. The target blood glucose in the pre-operative, anaesthetised or sedated patient should be 6-10mmol/L (up to 12mmol/L may be acceptable). Capillary blood glucose (CBG) target ranges are controversial. Aim for CBG between 6-10mmol/L but 4 – 12mmol/L is acceptable. Avoid wide swings in CBG.". And "For patients requiring a VRIII, the long-acting analogue (Glargine/Lantus®, Degludec/Tresiba®, Detemir/Levemir®) should be continued alongside the VRIII during the peri-operative period. Evidence shows that this reduces the risk of rebound hyperglycaemia when the VRIII is discontinued" (*J Clin Endocrinol Metab* 2012; **97**(9):3132-3137). **The dose the patient takes when they are well should be reduced by 20% whilst they are in hospital**" (*J Clin Anesth* 2012; **24**(8):610-617), and "Ensure that the insulin is prescribed correctly – i.e. using the brand name, and ensuring the word 'unit' is written out (not using the abbreviation 'u')".

8. In the fluid management section the following has been changed "The target blood glucose in the pre-operative, anaesthetised or sedated patient should be 6-10mmol/L (up to 12mmol/L may be acceptable).

9. In the section in Theatre and recovery, the target glucose levels have been made more explicit in the aims and action plan.

10. In the section in post-operative care section, the target glucose levels have been made more explicit in the aims and action plan.

11. In the controversial areas section:

a. The section on: What is the evidence that tight glycaemic control improves the outcome of surgery? Has been updated to include the following: the target blood glucose in the pre-operative anaesthetised or sedated patient has been advocated to be 6-10mmol/L, with up to 12mmol/L being acceptable (*Eur J Anaesthesiol* 2014; **31**(10):517-573). In the awake post-operative patient, not on a VRILL a range of 4-12mmol/L may be acceptable.

This change has been made because of feedback from anaesthetists who feel that in the anaesthetised or sedated patient who is unable to make others aware if they are hypoglycaemic, aiming for close to 4mmol/L puts them at risk of developing hypoglycaemia. In addition, the NICE-SUGAR data of 6024 ITU patients (who aimed for 4.5-6.0mmol/L in the intensive treatment arm) found that 82.4% of all moderate hypos (that occurred in 45% of the entire cohort) occurred in the intensive treatment arm and 93.3% of all severe hypos (that were experienced by 3.7% of the entire cohort) occurred in the intensive treatment arm.

b. The section on: What is the upper limit of HbA_{1c} acceptable for patients undergoing elective surgery? Has been amended to include a recent publication that shows an HbA_{1c} of >8% was associated with poorer outcomes.

Updated with new information/evidence/figures

1. The following has been added or amended in the main recommendations section:

a. All institutions should have a clinical lead for the peri-operative management of patients with diabetes whose responsibility it is to ensure that the institution has up to date guidelines that are implemented. The clinical lead should also ensure that all patients with diabetes are optimally managed during their surgical admission.

b. All letters of referral from primary care to a surgical speciality should identify patients with diabetes.

c. Day of surgery admission should be the 'default' position. Diabetes specific pre-admission should be avoided.

2. The prevalence of diabetes in the UK had been updated.

3. The prevalence of inpatient diabetes had been updated.

4. Where necessary, the document has been updated to include data from the 2013 NaDIA.

5. A statement has been included to acknowledge a new publication stating that HbA_{1c} is not associated with surgical outcomes, but that the data that this conclusion comes from is from poor quality studies with small sample sizes.

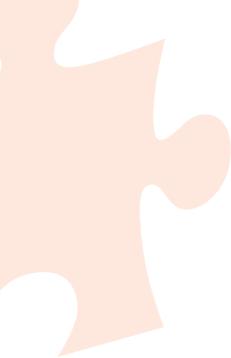
6. Data from Marion Kerr has been included to reflect a better understand of the costs of diabetes – in particular the costs of day case avoidance.

7. A paragraph has been added mentioning the uptake of JBDS guidelines and how these are beginning to show evidence of standardisation of care across the UK and improved outcomes.

8. There is a paragraph to explain why there have been some changes to the document.

9. The paragraph on oral carbohydrate loading has been modified.

10. An extra line has been added to the 'recommendations' - Until Diabetes Inpatient Specialist Nurses, or other members of the Diabetes Inpatient Specialist Team are available for consultation 7 days per week, it may be prudent to avoid operating on patients with diabetes routinely at weekends.
11. The following has been added to the section on Order of lists: however, prioritisation is not needed for patients who have diet controlled diabetes.
12. In the section 'Anticipated long starvation period (more than one missed meal)' the following has been added "Remember to reduce the dose of long acting background insulin by 20%".
13. The second paragraph in the special circumstances section has been updated to reflect the use of pumps (CSII) better than in the first edition.
14. The emergency surgery section has been updated to allow for situations where a VRIII can be avoided to allow for peri-operative manipulation of drugs as outlined in Appendices 1 and 2.
15. An addition reference has been added to the stress hyperglycaemia section and some minor wording changes made.
16. The recommendations in that section has also been updated to say that at least 2 cannulae are needed – but also that a VRIII should never be stopped in someone with T1DM unless a short acting insulin has been given.
17. In the safe use of insulin section, the following has been added: "Ensure that insulin is prescribed using the brand name, written out in full".
18. In the section on safe use of VRIII the following has been added: "For patients requiring a VRIII, the long-acting analogue (Glargine/Lantus®, Degludec/Tresiba®, Detemir/Levemir®) should be continued alongside the VRIII during the peri-operative period. Evidence shows that this reduces the risk of rebound hyperglycaemia when the VRIII is discontinued" (*J Clin Endocrinol Metab* 2012; **97**(9):3132-3137). **The dose the patient takes when they are well should be reduced by 20% whilst they are in hospital"** (*J Clin Anesth* 2012; **24**(8):610-617).
19. The section on emergency surgery in the safe use of insulin section has been deleted because this is dealt with elsewhere.
20. In the controversial areas section of the long acting insulins – it is mentioned that long acting analogues be continued but that the dose be reduced by 20% to prevent hypoglycaemia in 'grazers'. (*J Clin Anesth* 2012; **24**(8):610-617).
21. The comment about weekend operating (comment 15 above) is repeated here.
22. A whole new section has been added to the controversial areas section on the manipulation of diabetes drugs to facilitate day of surgery admission.
23. The reference for metformin and contrast media has been updated to the 2015 RCR document. – This has also been added to box 13 (main document).
24. The section on metformin has been extensively reviewed to ensure consistency.
25. In the section on dexamethasone, the following has been added: "Specific guidance on the management of steroid induced hyperglycaemia has been produced by JBDS and is available at <http://www.diabetologists-abcd.org.uk/JBDS/JBDS.htm>".
26. New audit standards have been added –
 - a. Insulin must always be prescribed by brand name, written out in full. With a target of 100%.
 - b. Percentage of people with diabetes who are listed for elective surgery who are admitted on the day of the procedure. With a target of 100% (An exclusion for this is where other significant co-morbidity needs pre-operative optimisation).



c. Percentage of people with diabetes who have a surgical condition that would normally be managed as a day case who have no other day surgery contraindications who are listed for day case surgery. With a target of 100% (An exclusion for this is where other significant factors necessitate an inpatient stay).

27. The VRIII rate of infusion chart has been changed to be consistent with the one from the medical VRIII document from Dr Stella George.

28. Appendix 8 has been updated to be consistent with Appendices 1 and 2.

29. The references have all been updated and websites checked to see if they still exist!

Administrative changes

1. Nick Levy has now been placed as second author.

2. The name of Sister Stephanie Leonard from Bolton has been added to the list. of contributors (she was inadvertently left off the first edition).

