Peri-operative Management of Surgical Patients with Diabetes

National Confidential Enquiry into Patient Outcome and Death (NCEPOD)

Anaesthetic Questionnaire

CONFIDENTIAL

DETAILS OF THE CLINICIAN COMPLETING THIS QUESTIONNAIRE

Grade: _____ **Specialty:** _____

What is this study about?

NCEPOD is undertaking a study to identify and explore remediable factors in the process of care in the peri-operative management of surgical patients with diabetes. This study aims to review the whole patient pathway from referral to surgery (elective or emergency) to discharge from hospital.

Inclusions:

- Patients aged 16 and over:
- who have a diabetes mellitus ICD10 code (E10.0-E11.0 inclusive in any position)
- who were admitted as either an emergency, elective or unplanned admission (e.g. following day surgery)
- who had a hospital stay of at least one night post surgery
- and who had a major surgical procedure between 1st February - 31st March 2017 (inclusive)

Exclusions:

- Patients undergoing day surgery without an overnight stay
- Obstetric surgery
- Minor procedures - OPCS codes available on our website http://www.ncepod.org.uk/pd.html

Elective patients	**- Section 1 and 3**
Emergency patients	**- Section 2 and 3**

CPD accreditation:

Consultants completing NCEPOD questionnaires make a valuable contribution to the investigation of patient care. It also provides an opportunity for consultants to review their clinical management and undertake a period of personal reflection. These activities have a continuing medical and professional development value for individual consultants. Consequently, NCEPOD recommends that consultants who complete NCEPOD questionnaires keep a record of this activity which can be included as evidence of internal/self directed Continuous Professional Development in their appraisal portfolio.

Questions or help?

If you have any queries about this study or this questionnaire, please contact:

pd@ncepod.org.uk or telephone: 020 7251 9060

Thank you for taking the time to complete this questionnaire. The findings of the study will be published in late 2018.

If you (the clinician completing the questionnaire) would like email confirmation of the completion of this questionnaire for your records, please supply your email address clearly below:

FOR NCEPOD USE ONLY

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CODES FOR GRADE

01 – Consultant
02 – Staff grade/Associate specialist
03 – Trainee with CCT
04 – Senior specialist trainee (ST3+ or equivalent)
05 – Junior specialist trainee (ST1&ST2 or CT equivalent)
06 – Basic grade (HO/FY1 or SHO/FY2 or equivalent)
07 – Specialist nurse (nurse consultant, nurse practitioner, clinical nurse specialist
08 – Senior staff nurse,enrolled nurse (EN) etc)
10 – Non-registered staff (HCA etc.)

DEFINITIONS

Diabetic ketoacidosis	Consistently high blood glucose levels can lead to a condition called diabetic ketoacidosis. This happens when a severe lack of insulin means the body cannot use glucose for energy, and the body starts to break down other body tissue as an alternative energy source. The diagnosis is made with a pH <7.3, bicarbonate concentration <15mmol/l and a glucose of >11 (or a history of diabetes), and ketosis (urine ketones more than ++ and/or blood ketone level >3mmol/l).
HbA1c	HbA1c (also referred to as A1c or haemoglobin A1c) refers to glycated haemoglobin. It develops when haemoglobin, a protein within red blood cells that carries oxygen throughout the body, joins with glucose in the blood, becoming 'glycated'. By measuring glycated haemoglobin (HbA1c), clinicians are able to get an overall picture of what the average blood sugar levels have been over a period of weeks/months. For people with diabetes this is important as the higher the HbA1c, the greater the risk of developing diabetes-related complications
Hyperosmolar hyperglycemic state	HHS is s a complication of diabetes mellitus (predominantly type 2) in which high blood sugars cause severe dehydration, increases in osmolarity (relative concentration of solute) and a high risk of complications, coma and death. It is diagnosed with blood tests. A glucose >30mmol/l, an osmolality of >320mOsmol/l with dehydration.
Hypoglycemia	Hypoglycemia occurs when blood glucose levels fall below 4 mmol/L (72mg/dL).
Link nurse	Link nurses are part of a system that shares information and provides formal, two-way communication between specialist teams and nurses in the clinical area. Many different clinical areas might employ such nurses, including tissue viability and diabetes
Macrovascular disease	Disease of the large blood vessels, including the coronary arteries, the aorta, and the large arteries in the brain and in the limbs. This sometimes occurs when a person has diabetes for a long time.
Microvascular disease	Disease of the finer blood vessels in the body, including the capillaries. The microvascular complications of diabetes such as neuropathy can lead to loss of sensation and the development of foot ulcers.
Pre-operative assessment clinic	The pre-operative assessment clinic is a nurse-led clinic that specialises in preparing patients for their planned surgery.
Variable Rate Intravenous Insulin Infusion (VRIII)	The infusion of intravenous insulin at a variable rate according to regular capillary blood glucose measurements with the aim of controlling serum glucose levels within a specified range. The VRIII is usually accompanied by an infusion of fluid containing glucose to prevent insulin-induced hypoglycaemia.

ORAL HYPOGLYCAEMIC AGENTS

Biguanides
Metformin IR
Metformin SR

Meglitinides
Repaglinide
Nateglinide

Sulphanylureas
Amaryl (glimepiride)
Daonil (glibenclamide)
Diamicron (gliclazide)
Diamicron MR (gliclazide)
Glibenese (glipizide)
Minodiab (glipizide)
Tolbutamide

Thiazolidinediones (glitazones)
Avandia (rosiglitazone)
Actos (pioglitazone)
Rezulin (troglitazone)

Alpha glucosidase inhibitors
Miglitol
Acarbose
Voglibose

SGLT-2 inhibitors
Forxiga (dapagliflozin)
Invokana (canagliflozin)
Jardiance (empagliflozin)

Dipeptidyl peptidase IV inhibitors
Vildagliptin
Sitagliptin
Saxagliptin
Linagliptin

1. **Was this an elective or emergency admission?**

☐ **Elective** (please complete Sections 1 and 3)

☐ **Emergency** (please complete Sections 2 and 3)

Section 1 - Elective patients only

PRE-OPERATIVE ASSESSMENT

2a. Did the patient attend a pre-operative assessment clinic (POAC)* ☐ Yes ☐ No - go to Q6

*Definitions on page 2

2b. If Yes to 2a, who did they see in the pre-operative assessment clinic? *Definitions on page 2

☐ Consultant ☐ Non training grade doctor ☐ Training grade doctor

☐ Diabetes specialist nurse ☐ Dietitian ☐ POAC nurse ☐ Link nurse*

☐ Other (please state):

3a. Was information on the management of the patient's diabetes in the community available at the pre-operative assessment clinic? (i.e. GP referral letter or GP notes)

☐ Yes ☐ No ☐ Unknown

3b. If Yes to 3a, what did it include: **(please select all that apply)** *Definitions on page 2

☐ Evidence of regular blood sugar measurement ☐ HbA1c* (within the last 3 months)

☐ Patient co-morbidities ☐ Urgency of referral

☐ Community diabetes specialist nurse assessment or notes ☐ BMI

☐ List of current medication ☐ Blood pressure

☐ Evidence from primary care about the need to optimise the patient's diabetes before surgery ☐ Estimated glomerular filtration rate (eGFR)

Diabetes related complications **(please select all that apply)**

☐ Cardiovasuclar ☐ Neuropathy ☐ Nephropathy

☐ Skin problems ☐ Retinopathy ☐ Peripheral vascular disease

☐ Cerebrovascular (with full recovery)

☐ Cerebrovascular (with minor residual disability)

☐ Cerebrovascular (with major disability affecting day to day life)

4a. Was a recent HbA1c* (3 months prior to surgery) available at the pre-operative assessment clinic?

☐ Yes ☐ No ☐ Unknown

4b. If Yes to 4a, was the HbA1c >8.5% or 69 mmol/L? ☐ Yes ☐ No ☐ Unknown

4c. If Yes to 4b, was there an attempt to improve control, before admission, by referral to:

☐ Diabetes team ☐ Primary care ☐ Admitted to secondary care for optimisation

☐ Dietitian ☐ None ☐ Unknown

☐ Other (please state):

4d. If the answer to 4c was 'None', and if the patient's HbA1c was >8.5% or 69mmol/L, was a reason documented as to why not?

☐ Yes ☐ No ☐ Unknown

4e. If Yes to 4d, please provide the reason:

5a. Following attendance at the pre-operative assessment clinic, were any changes made to the patient's diabetes management to optimise them for surgery?

☐ Yes ☐ No ☐ Unknown

5b. If Yes to 5a, what changes were undertaken?

6a. Was this patient booked as a day case? ☐ Yes ☐ No ☐ Unknown

6b. Was this appropriate? ☐ Yes ☐ No

6c. If No to 6b, please state why not:

6d. If No to 6a, should or could the patient have been booked as a day case? ☐ Yes ☐ No

7. Was a generic pre-assessment proforma completed for this patient?

☐ Yes ☐ No ☐ Unknown

8. If surgery was considered more important than the need for diabetes optimisation and HbA1c was > 8.5% or 69 mmol/L was a variable rate intravenous insulin infusion* (VRIII - previously known as sliding scale) commenced on admission?

***Definitions page 2**

☐ Yes ☐ No ☐ Unknown ☐ N/A

9a. Was the patient first on the scheduled operating list? ☐ Yes ☐ No

9b. If No to 9a, please state why not:

9c. What time of day was the patient booked to be on the operating list:

☐☐ ☐☐ (hh:mm) ☐ Unknown

10a. For how long was the patient fasted pre-operatively? ☐☐ hours

10b. How many meals did the patient miss pre-operatively? ☐☐

11a. Did prolonged starvation result in a change in the management of the patient's diabetes?

☐ Yes ☐ No

11b. If Yes to 11a, did this include: **(please mark all that apply)**

☐ Start of VRIII ☐ IV fluids ☐ Other (please state):

End of Section 1 - please continue to Section 3

Section 2 - Emergency patients only

12a. Was the patient admitted whilst on an elective waiting list? ☐ Yes ☐ No - go to Q14

12b. Had the patient attended a pre-operative assessment clinic (POAC)* ☐ Yes ☐ No

12c. If Yes to 12b, who did they see in the pre-operative assessment clinic?

☐ Consultant ☐ Non training grade doctor ☐ Training grade doctor

☐ Diabetes specialist nurse ☐ Dietitian ☐ POAC nurse ☐ Link nurse*

☐ Other (please state): _____

13a. Was information on the management of the patient's diabetes in the community available at the pre-operative assessment clinic? (i.e. GP referral letter or GP notes)

☐ Yes ☐ No

13b. If Yes to 13a, what did it include: **(please select all that apply)** ***Definitions on page 2**

☐ Evidence of regular blood sugar measurement ☐ HbA1c* (within the last 3 months)

☐ Patient co-morbidities ☐ Urgency of referral

☐ Community diabetes specialist nurse assessment or notes ☐ BMI

☐ List of current medication ☐ Blood pressure

☐ Evidence from primary care about the need to optimise the patient's diabetes before surgery ☐ Estimated glomerular filtration rate (eGFR)

Diabetes related complications **(please select all that apply)**

☐ Cardiovasuclar ☐ Neuropathy ☐ Nephropathy

☐ Skin problems ☐ Retinopathy ☐ Peripheral vascular disease

☐ Cerebrovascular (with full recovery)

☐ Cerebrovascular (with minor residual disability)

☐ Cerebrovascular (with major disability affecting day to day life)

14. If the patient had diabetic ketoacidosis* was this being treated pre-operatively? ***Definitions on page 2**

☐ Yes ☐ No ☐ N/A ☐ Unknown

15. Did the patient go to a high care area prior to surgery for optimisation?

☐ Yes ☐ No ☐ Unknown

End of Section 2 - please continue to Section 3

Section 3 - To be completed for ALL patients

PRE-OPERATIVE MANAGEMENT

16. On admission was there any record of: **(please mark all that apply)**

☐ Blood ketone measurement ☐ Urine ketone measurement ☐ None ☐ Unknown

☐ N/A (blood ketone measurement not required)

17. Which of the following staff were involved in the decisions around the overall management of this patient?

☐ Consultant surgeon ☐ Consultant anaesthetist ☐ Consultant diabetologist

☐ Diabetes specialist nurse ☐ Consultant in intensive care medicine

18a. On admission to hospital was a pre-operative assessment of risk made? ☐ Yes ☐ No

18b. If Yes to 18a, which of the following were used:

☐ P-POSSUM ☐ SORT ☐ ASA ☐ American College of Surgeons risk assessment

☐ Other (please specify): _____

18c. If ASA was used, please state the patient's ASA grade immediately prior to surgery:

☐ ASA I A normal healthy patient

☐ ASA II A patient with mild systemic disease

☐ ASA III A patient with severe systemic disease

☐ ASA IV A patient with severe systemic disease that is a constant threat to life

☐ ASA V A moribund patient who is not expected to survive the operation

19. Was a pre-operative risk of post-operative nausea and vomiting carried out? (e.g. apfel score)

☐ Yes ☐ No ☐ Unknown

20a. Following admission was there any further delays in order to optimise the patient's condition for surgery?

☐ Yes ☐ No ☐ Unknown

20b. If Yes to 20a, how long was the delay? ☐☐ hours ☐☐ days

20c. If Yes to 20a, was this related to:

☐ Diabetes control ☐ Co-morbidities ☐ Theatre availability ☐ Other

20d. If 'co-morbidites' or 'other' please describe:

_____

21a. Following admission was the patient seen by an anaesthetist on the day of surgery? ☐ Yes ☐ No

21b. If Yes to 21a, please answer the following:

i) Anaesthetist's grade: ☐☐ **Please use grade codes on page 2**

ii) Was the assessment carried out by the anaesthetist documented? ☐ Yes ☐ No

iii) Was a diabetes management plan documented? ☐ Yes ☐ No

iv) Were the patient's co-morbidities, related to their diabetes, documented in this assessment? ***Definitions on page 2**

☐ Yes - macrovascular disease* ☐ Yes - microvascular disease*

☐ No

Q21b continued

v) Were the patient's diabetes medications documented as part of this assessment? ☐ Yes ☐ No

vi) If Yes to 21b-v, which diabetes medicines was the patient on?

☐ None - diet controlled

Insulin

☐ Once daily ☐ Twice daily ☐ 3 times a day ☐ 4 times a day ☐ 5 times a day

Oral hypoglycaemic agents (please see page 2 for medicine references)

☐ Meglitinides ☐ Biguanides ☐ SGLT-inhibitors ☐ Sulphonylureas ☐ DPP IV inhibitors

☐ Alpha glucosidase inhibitors ☐ Thiazolidinediones (gliztazones)

Other injectable therapy

☐ GLP-1 (analogues)

22a. Was the patient on an enhanced recovery programme? ☐ Yes ☐ No ☐ Unknown

22b. If Yes to 22a, did they undergo pre-operative carbohydrate loading? ☐ Yes ☐ No ☐ Unknown

22c. If Yes to 22b, what was used?

☐ Pre-load ☐ Pre-op nutrition and carbohydrate loading ☐ Other (please specify):

22d. If Yes to 22b, was pre-operative carbohydrate loading given (please select all that apply):

☐ The night before surgery ☐ 2 hours before transfer to theatre

☐ The morning of surgery (>2 hours before transfer to theatre)

22e. Were capillary blood glucose measurements taken after carbohydrate loading?

☐ Yes (please state): ☐☐.☐ mmol/L ☐ No ☐ N/A

22f. If No to 22a, was the capillary blood glucose between 6-10 mmol/L on the day of surgery?

☐ Yes ☐ No

23a. Were capillary blood glucose measurements recorded during surgery? ☐ Yes ☐ No ☐ Unknown

23b. If Yes to 23a, was this recorded hourly? ☐ Yes ☐ No ☐ Unknown

23c. If Yes to 23a, were all the capillary blood glucose measurements between 6-10mmol/L?

☐ Yes ☐ No ☐ Unknown

i) If No to 23c, what was the lowest capillary blood glucose? ☐☐☐ mmol/L

ii) If No to 23c, what was the highest capillary blood glucose? ☐☐☐ mmol/L

24a. Was any subcutaneous insulin administered? ☐ Yes ☐ No ☐ Unknown

24b. If Yes to 24a, please state reason why?

25. Was a WHO surgical checklist performed? ☐ Yes ☐ No ☐ Unknown

26. Was diabetes management discussed as part of the WHO checklist? ☐ Yes ☐ No ☐ Unknown

27. Which IV fluids were administered separately from VRIII*?

	Pre- operatively	Intra- operatively	Post- operatively
Hartmanns	☐	☐	☐
4% dextrose saline in 0.18% saline	☐	☐	☐
5% dextrose in 0.45% saline	☐	☐	☐
Dextrose saline in 0.18%	☐	☐	☐
5% dextrose in 0.9% saline	☐	☐	☐
5% dextrose	☐	☐	☐
0.9% saline	☐	☐	☐
Added magnesium	☐	☐	☐
Added potassium	☐	☐	☐
Other (please state):	☐	☐	☐

28. Was urine output monitored? **(please select all that apply)**

☐ Pre-operatively ☐ Intra-operatively ☐ Post-operatively

☐ Not monitored ☐ Unknown

ANAESTHESIA

29a. What type of anaesthesia was used?

☐ Local only ☐ Regional only ☐ Regional and sedation

☐ General only ☐ General and regional ☐ General and local infiltration

29b. Which of the following where used to minimise post-operative nausea and vomiting:
(please select all that apply)

☐ 5HT3 antagonist (e.g. ondansetron/ granisetron) ☐ Dopamine antagonists (e.g. prochlorperazine)

☐ Antihistamines (e.g. cyclizine) ☐ Dexamethasone

☐ Total intravenous anaesthesia ☐ Other (please state):

30. What grade of anaesthetist administered the anaesthetic? ☐☐ **Please see grades on page 2**

31. Was the anaesthetist who administered the anaesthetic the same as the one who saw the patient pre-operatively?

☐ Yes ☐ No ☐ N/A (patient not seen by anaesthetist pre-operatively)

32a. Did the patient arrive in theatre with a variable rate intravenous insulin infusion* (VRIII) set up?

☐ Yes ☐ No ☐ Unknown ***Definitions on page 2**

32b. If Yes to 32a, was this appropriate? ☐ Yes ☐ No

32c. If No to to 32b, please state why not:

32d. If the patient arrived in theatre with a VRIII set up, was this stopped:

☐ Prior to the operation ☐ During the operation ☐ Not stopped

32e. If stopped, when was VRIII re-started? ☐☐ hours later ☐ N/A not stopped

33a. If the patient did not arrive in theatre with a VRIII set up, was VRIII commenced intra-operatively?

☐ Yes ☐ No ☐ N/A

33b. If Yes to 33a, please the state reason why:

34. If VRIII was used, was it recorded on the anaesthetic chart? ☐ Yes ☐ No ☐ N/A

35. Which intravenous fluid was administered as part of VRIII?

36. Was invasive cardiovascular monitoring used? ☐ Yes ☐ No

37. Did the patient develop any of the following diabetes complications intra-operatively: ***Definitions on page 2**

☐ Hypoglycaemia* requiring treatment (<4mmol/L) ☐ Diabetic ketoacidosis*

☐ Hyperosmolar hyperglycaemic state* ☐ Other (please state):

38a. Were intra-operative urea and electrolytes recorded as part of arterial blood gas measurements?

☐ Yes ☐ No

38b. If Yes to 38a, were they abnormal? ☐ Yes ☐ No

38c. If Yes to 38b, please provide further details:

39. Were there any episodes of hypotension? ☐ Yes ☐ No

40a. Were there any untoward events? ☐ Yes ☐ No

40b. If Yes to 40a, please state:

POST OPERATIVE MANAGEMENT

41. Was capillary blood glucose measured in the theatre recovery area? ☐ Yes ☐ No

42. Following theatre recovery, where did the patient go?

☐ Discharge lounge ☐ Day surgery unit ☐ Medical ward ☐ Surgical ward

☐ Critical care

43. Was multimodal analgesia prescribed? ☐ Yes ☐ No

44. Were nonsteroidal anti-inflammatory drugs part of the post-operative analgesia regimen?

☐ Yes ☐ No ☐ Unknown

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45. How soon after surgery did the patient eat? ☐☐ hours

46. Was the specialist diabetes team involved within the first 24 hours in the post-operative management?

☐ Yes ☐ No ☐ Unknown

47. If the patient had Type 1 diabetes, how long after their first post-operative dose of subcutaneous insulin was the VRIII stopped?

☐☐ hours ☐☐ days ☐ N/A patient did not have Type 1 diabetes

48. What arrangements were made to ensure the patient returned safely to their normal diabetes medication?

☐ Diabetes post-operative pathway ☐ Anaesthetic care plan ☐ Surgical care plan

☐ Diabetes team review ☐ Other (please state):

49. Were there clear instructions documented as to how the patient should return to their normal diabetes medication?

☐ Yes ☐ No ☐ Unknown

50. What was the discharge destination of this patient?

☐ Usual place of residence ☐ Patient died during this admission

☐ Transferred to another hospital

51. Please provide any further comments relating to this case. With the benefit of hindsight, is there anything, in your opinion, that should have been done differently? Was this related to clinical or organisational aspects of care? (N.B. please continue your answer using the box on the following page if more space is required). Please know that all answers are confidential

This study was commissioned by The Healthcare Quality Improvement Partnership (HQIP) as part of the Clinical Outcome Review Programme into medical and surgical care.

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