**Introduction**

Diabetes is a serious, lifelong condition where blood glucose levels are too high. There are two main types; type 1 caused by the body not being able to produce any insulin and type 2 where the body does not make enough insulin.

The care of patients with diabetes is complex and this is particularly true of those undergoing surgery. The care can cross numerous specialties which can compound the issue of diabetes not being managed consistently. The recent National Diabetes Inpatient Audit showed that 18% of inpatients have diabetes, and previous work has shown that more than 15% of patients undergoing surgical procedures are known to have diabetes, therefore it is essential that all staff are familiar with diabetes management to ensure care of the patient’s glycaemic control, along with the clinical reason for their admission and surgery is coordinated and appropriate.

There are many national guidelines to aid clinicians in managing perioperative diabetes, published by the Association of Surgeons of Great Britain and Ireland (ASGBI), Association of Anaesthetists of Great Britain and Ireland (AAGBI), Joint British Diabetes Society (JBDS) and the British Association of Day Surgery (BADS). These guidelines are not always followed and do not encourage joint specialty working.

NCEPOD’s report [Highs and Lows](http://www.ncepod.org.uk/2018pd.html) includes an assessment of service structure at an organisational level and patient care at a clinical level. Recommendations are formed from data provided by clinicians at the hospital caring for patients and from external peer review of a sample of cases.

The areas for improvements in care raised by this report, and the recommendations made, have the potential to impact a large portion of surgical patients, providing quality improvement goals for hospitals to measure their practice against.

View the report at [www.ncepod.org.uk/2018pd.html](http://www.ncepod.org.uk/2018pd.html).

**Patient population**

Patients aged 16 and over were included who were admitted to hospital either as an emergency or for an elective procedure with an ICD10 code for diabetes mellitus (E10.0-E11.9) and who had a major surgical procedure with a minimum one night stay.

**Clinical issues**

* Lack of information in referral letters about the management of the patient’s diabetes in the community
* Around half of elective referrals in this study were made by general practitioners
* The recording of co-morbidities and current medication were frequently provided, although evidence of regular blood sugar, blood pressure measurement, urgency of referral and body mass index (BMI) were not
* Half of referral letters had no information on the management of the patient’s diabetes in the community
* Where information was provided in the referral letter, HbA1c measurements within the previous three months were often not provided
* Most elective patients attended a preoperative assessment clinic
* Many patients had no documented specific instructions on management of their diabetes prior to surgery
* Most case notes had no documented evidence that the patient was included in developing their diabetes plan
* Case reviewers felt that inadequate medicines reconciliation by medical staff occurred in a sixth of the sample and by a pharmacist in a quarter
* Diabetes teams were rarely consulted pre-operatively
* A fifth of the patients had an inadequate nutritional assessment
* Almost all of patients were assessed using an ASA score
* Theatre availability and co-morbid conditions were the most common cause of delays to surgery, whilst poor glycaemic control was the least common factor for delays
* More than a half of patients did not have a clear plan recorded for the management of their diabetes on the day of surgery
* Case reviewers felt that diabetes medicines were not managed appropriately in a sixth of the cases
* A surgical safety checklist was used for almost all patients but diabetes management was not included in a third
* Including diabetes in the surgical safety checklist was associated with more appropriate management of diabetes in the theatre recovery area
* A fifth of patients were not scheduled appropriately for their surgery in the opinion of the case reviewers
* Adequate discharge arrangements were not made for the patient’s diabetes care in a fifth of patients, in the opinion of the case reviewers.

**Organisational issues**

* Most hospitals have a day surgery service or standalone day surgery unit
* More than a half of hospitals with a day surgery unit had a clinical lead or director of the day surgery unit and a dedicated pre-operative assessment clinic
* Half of hospitals had a policy stating that all investigations should be performed during a single pre-operative assessment clinic visit
* More than a half of pre-operative assessment clinics had a specific policy for management of diabetes patients undergoing surgery
* Most hospitals where emergency surgery was performed had a co-ordinator for emergency theatre bookings
* A fifth of hospitals where emergency surgery was performed had no system for confirming that relevant investigations and resuscitation status had been completed and that the patient was fit for surgery
* Most hospitals had a policy or guideline on managing operating lists. Most of these specified that patients with diabetes should be prioritised early on the morning or afternoon theatre list
* A sixth of hospitals had no policy for selecting patients for day surgery
* A third of hospitals where elective surgery was performed and a sixth of hospitals where emergency surgery was performed did not routinely use risk scoring systems prior to surgery
* Fewer than a third of hospitals had a named clinical lead for perioperative diabetes
* Follow-up arrangements following changes to medication for patients with diabetes undergoing surgery were extremely variable
* A quarter of hospitals reported conducting an audit of perioperative diabetes management
* Three quarters of hospitals took part in enhanced recovery programmes; half of these had no guidance for patients with diabetes.

**Benefits of including perioperative diabetes in commissioning arrangements**

Good control of diabetes in surgical patients can improve outcomes. Improved perioperative diabetes care can lead to reduced delays in surgery and in length of stay.

**Key features of a service**

* A clinical lead for perioperative diabetes care in hospitals where surgical services are provided
* A standardised referral process for elective surgery to ensure appropriate assessment and optimisation of diabetes
* Patients with diabetes undergoing surgery are closely monitored and their glucose levels managed accordingly
* System markers and alerts are used to raise awareness of glucose levels, e.g. tagging of electronic medical records, use of a patient passport or unique stickers in paper-based case notes
* Safe handover of patients with diabetes from theatre recovery to ward
* A pre-operative assessment clinic policy and standards for the management of patients with diabetes
* Patients with diabetes attending a pre-operative assessment clinic prior to elective surgery have access to the diabetes multidisciplinary team and written instructions regarding their diabetes management plan prior to surgery
* A clinical lead for day surgery in place in all hospitals providing day surgery services
* Policies to ensure patients with diabetes have equity of access to day surgery
* Elective surgery cancellation rates are audited locally and the results acted upon
* Referral criteria for surgical inpatients with diabetes
* Monitoring the time at which a patient begins fasting (for surgery or clinical reasons). Care is escalated to the responsible medical team if patients miss more than one meal.
* Patients with diabetes are prioritised on the operating list to avoid prolonged starvation
* Patients with diabetes are provided with education and information about their diabetes management at discharge from hospital as part of the discharge planning process

**National guidance and reports**

ASA Physical Status Classification System. American Society of Anaesthesiologists. <https://www.asahq.org/resources/clinical-information/asa-physical-statusclassification-system>

Association of Anaesthetists of Great Britain and Ireland. Peri-operative management of the surgical patient with diabetes 2015. Anaesthesia 2015; 70: 1427-1440 [https://www.aagbi.org/sites/default/files/Diabetes%20FINAL%20published%20in%20Anaesthesia%20Sept%2015%20with%20covers%20for%20online[1].pdf](https://www.aagbi.org/sites/default/files/Diabetes%20FINAL%20published%20in%20Anaesthesia%20Sept%2015%20with%20covers%20for%20online%5B1%5D.pdf)

Association of Surgeons of Great Britain and Ireland. Issues in professional practice: Guidelines for implementation of enhanced recovery protocols. 2009. <http://asgbidocuments.surgicalmembershipportal.co.uk/issues%20in%20Professional%20Practice/issues_in_professional_practice_eras_guidelines_-_as_gone_to_press.pdf>

Association of Surgeons of Great Britain and Ireland. Pre-operative Assessment and Patient Preparation: The Role of the Anaesthetist. 2010 <https://www.aagbi.org/sites/default/files/preop2010.pdf>

British Association for Parenteral and Enteral Nutrition. The ‘MUST’ Explanatory Booklet: A Guide to the ‘Malnutrition Universal Screening Tool’ (‘MUST’) for Adults. 2003. <https://www.bapen.org.uk/pdfs/must/must_explan.pdf>

Dhatariya, K, Levy, N, Kilvert et al. NHS Diabetes guideline for the perioperative management of the adult patient with diabetes. Diabetic Medicine 2012, 29(4), 420-433

Joint British Diabetes Societies for Inpatient Care. Management of adults with diabetes undergoing surgery and elective procedures: Improving standards. 2016. <http://www.diabetologists-abcd.org.uk/JBDS/Surgical_guideline_2015_summary_FINAL_amended_Mar_2016.pdf>

Joint British Diabetes Societies Inpatient Care Group. The Management of Diabetic Ketoacidosis in Adults. 2nd edition, 2013.

<http://www.diabetologists-abcd.org.uk/JBDS/JBDS_IP_DKA_Adults_Revised.pdf>

Joint British Diabetes Societies Inpatient Care Group. The use of variable rate intravenous insulin infusion (VRIII) in medical inpatients. 2014. <https://abcd.care/sites/abcd.care/files/resources/JBDS_IP_VRIII.pdf>

Joint British Diabetes Society for Inpatient Care. Joint British Societies for Inpatient Care: clinical guidelines and improving inpatient diabetes care. Diab Med 2018; 35(8): 988-991

National Diabetes Inpatient Audit. England and Wales, 2017. Surgical data. <https://digital.nhs.uk/data-andinformation/find-data-and-publications/supplementaryinformation/2018-supplementary-information-files/national-diabetes-inpatient-audit-nadia-2017-inpatientsthat-had-undergone-surgery>

National Institute for Health and Care Excellence (NICE). NICE Guideline NG17. Type 1 diabetes in adults: diagnosis and management. 2016. <https://www.nice.org.uk/guidance/ng17/resources>

National Institute for Health and Care Excellence (NICE). Quality Standard QS24. Nutrition Support in Adults. 2012. <https://www.nice.org.uk/guidance/qs24>

NCEPOD. Who Operates When? (1995/6) <https://www.ncepod.org.uk/1995_6.html>

NCEPOD. An Age Old Problem. A review of the care received by elderly patients undergoing surgery. (2010) <https://www.ncepod.org.uk/2010eese.html>

NCEPOD. Knowing the Risk. (2011) <https://www.ncepod.org.uk/2011poc.html>

NELA Project Team. Third Patient Report of the National Emergency Laparotomy Audit. RCoA London, 2017.

NHS Digital. National Diabetes Inpatient Audit England and Wales, 2017. Published 2018. <https://digital.nhs.uk/data-and-information/publications/statistical/nationaldiabetes-inpatient-audit/national-diabetes-inpatientaudit-nadia-2017>

NHS England. New recommendations to further improve surgical safety. 2014. <https://www.england.nhs.uk/2014/02/surgical-safety/>

P-POSSUM. <http://www.riskprediction.org.uk/index-pp.php>

Stocker, M., Montgomery J., Russon, K et al. Royal College of Anaesthetists. Guidelines for the Provision of Anaesthesia Services: Chapter 6 Guidelines for the Provision of Anaesthesia Services for Day Surgery. 2018. <https://www.rcoa.ac.uk/system/files/GPAS-2018-06-DAYSURGERY.pdf>

Surgical Risk Calculator. American College of Surgeons. <https://riskcalculator.facs.org/RiskCalculator/index.jsp>

Surgical Outcome Risk Tool (SORT). NCEPOD and SOuRCe. <https://www.ncepod.org.uk/sort.html>