



Northamptonshire Healthcare
NHS Foundation Trust

MMPr022 PODIATRIC SURGERY PROTOCOL:

**PERI-OPERATIVE MANAGEMENT of ADULTS WITH
DIABETES UNDERGOING PODIATRIC SURGERY**

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Why we need this Protocol

The Podiatric Surgery service sits outside of the NGH/KGH district general hospital surgical directorates and structures and has a need to develop its own policies and protocols to support surgical practice. Below is a list specific to Podiatric Surgery:

1. Podiatric Surgery: standard operating procedures
2. Podiatric Surgery: pre-surgical assessment
3. Podiatric Surgery: diagnostic imaging – requesting
4. Podiatric Surgery: diagnostic imaging - use of the mini C-arm
5. Podiatric Surgery: local anaesthesia and steroid injection therapy
6. Podiatric Surgery: prevention of venous thrombo-embolic disease
7. Podiatric Surgery: peri-operative management of diabetic patients
8. Podiatric Surgery: theatre protocols - maintaining privacy and dignity
9. Podiatric Surgery: theatre protocols – surgery SOPs and LocSSIPs
10. Podiatric Surgery: theatre protocols – post-operative discharge
11. Podiatric Surgery: post-operative consultations
12. Podiatric Surgery: clinical and surgical emergencies
13. Podiatric Surgery: COSHH register and risk assessments
14. Podiatric Surgery: research, audit and PASCOM

What the Protocol is trying to do

This document outlines the Podiatric Surgery protocol developed to support peri-operative practice with regards to the Diabetic patient.

Patients with diabetes undergoing foot surgery are a vulnerable group – they often have complex co-morbidities and this Protocol is written to ensure that they are managed most effectively, reducing morbidity and mortality associated with surgery and enhance wound healing, based on evidence based practice.

This Protocol should be used in conjunction with the 'Pre Surgical Assessment Protocol'. Type 1 Diabetes will have been treated with insulin from the time of first diagnosis. Type 2 Diabetes will have been treated with diet or tablets at the first diagnosis but may be subsequently treated with either insulin or combination of insulin and tablets.

Which stakeholders have been involved in the creation of this Protocol

Podiatric Surgery Team

Any required definitions/explanations

CBG	capillary blood glucose
BMI	body mass index
BP	blood pressure
NHFT	Northamptonshire Healthcare NHS Foundation Trust
eGFR	estimated glomerular filtration rate
HbA1c	1c glycosylated haemoglobin

Key duties

The Adult Services Governance Committee

The Adult Services Governance Committee is responsible for:

- Approving the protocol and any subsequent updates

Consultant Podiatric Surgeon

The Consultant Podiatric Surgeons are responsible for:

- Ensuring the protocol is reviewed when necessary
- Ensuring all staff working to the protocol are adequately trained
- Sign off individuals when deemed competent (Appendix C)

The Team Leader

The team leader is responsible for:

- Dissemination of the protocol
- Highlighting any areas of concern or non-compliance to the Consultant Podiatric Surgeon

Protocol detail

Primary care referral

Ideally, the patient should be referred when their diabetes and possible co-morbidities are optimally controlled. The referral from the GP (or other HCP) should contain relevant medical information (Appendix 1). If this is not the case the patient should be referred back to their GP or further

information sought from the GP. The GP may consider referral to the diabetes specialist team for advice if HbA1c is greater than the optimal upper limit for surgery.

Outpatients

Ensure that the patient is well informed, understands the treatment options and has realistic expectations about the risks and benefits of surgery together with the anticipated recovery. Patients should be given time and support to reflect on this, supported by patient information leaflets in order to make an informed decision about whether to proceed with surgery.

An assessment of their current health status should be made, including BP and recent HbA1c and referral back to GP at this stage if these are suboptimal. There is insufficient evidence to recommend an upper limit of HbA1c prior to elective surgery and the risks associated with poor glycaemic control should be balanced against the necessity for surgery. However, an upper limit between 64-75 mmol/mol (8 and 9%) is acceptable, depending on individual circumstances¹.

Review X-ray films for signs of arterial calcification and record in the notes the potential for tourniquet insufficiency.

Pre-operative assessment

- Determine the type of diabetes and any co-morbidities.
- Determine what treatment they are on, how well controlled they are and how this is monitored. Ensure the patient has no history of repeated hypoglycaemic attacks or recurrent admission to hospital with complications related to diabetes.
- Ensure that all the usual selection criteria for day surgery have been met and that diabetic complications have been excluded or are well controlled. Careful planning is required, which the patient should be involved in.
- High-risk patients (poor glycaemic control/ complications of diabetes) should be identified and plans put in place to manage this risk e.g. referred back to GP to improve glycaemic control.
- Early pre-operative assessment should be arranged to determine a peri-operative management strategy and to identify and optimise co-morbidities e.g. hypertension.
- Glycaemic control has a significant impact on the risk of post-operative infection¹ (and post-operative glycaemic control significantly influences the healing of tissues post-operatively; patients should be counselled regarding this. Up to date blood tests should be sought including HbA1c, U&E, FBC, the GP copied in to receiving blood test results and surgery delayed if these are not optimal (risk should be balanced against urgency of the procedure).
- Advise patients to eat/drink as normal and take usual medications. They may wish to bring light snacks into hospital to maintain optimal blood glucose levels.

- Consider the need for antibiotic prophylaxis, either as a bolus dose on the day of surgery or as a post-operative course, according to surgical site infection guidance⁶.
- Careful assessment of vascular and neurological status should be performed. Patients presenting with peripheral vascular disease should not be put forward for elective surgery (Appendix 2)

Hospital admission

Check capillary blood glucose (CBG) once admitted to the ward. This is not required for patients who control their diabetes by diet alone or those on metformin. Training for blood glucose measurement should be given to all clinical staff and guidelines in place to support management of the patient if blood glucose levels fall out of accepted ranges (4-12 mmol/L), particularly hypoglycaemia (Appendix 4).

Theatre and recovery

CBG should be checked again (as necessary), prior to going into theatre and the WHO surgical safety checklist bundle may be used to advise the surgical team regarding CBG readings. Early tourniquet release may be considered to ensure vascular return.

Vascular return must be noted on the operation report. Access to hypoglycaemia box as necessary.

Post-operative care

Patients should be offered a drink and biscuits following surgery and the surgical foot and leg elevated. The dressing should be checked before discharge to ensure good vascular return and no post op bleeding. A trauma shoe should be issued and tubigrip to the operated leg (unless coban dressing has been applied).

Discharge

- Analgesia/ antibiotics may cause sickness. Advise regarding cessation of drugs if this occurs and to consult with team/GP for alternatives.
- Outcomes to be audited regularly via PASCUM.
- Encourage, rest elevation and hydration. Smoking cessation and a healthy diet.
- Neuropathy affects 30-50% of people with diabetes and places them at increased risk of heel ulceration, particularly if peripheral vascular disease is present. Patients should be encouraged to rest post-operatively but the importance of foot exercises to promote vascular supply and venous return emphasised.
- An appointment should be made to review the patient in the outpatient setting in one week. This should be sooner (3-4 days) if the patient is at risk (neuropathy/ infection).
- Ensure the patient has been informed of clinical signs of adverse events and knows how to seek help as necessary (e.g. clinical signs of infection or DVT).

Several factors influence glycaemic control post-operatively:

- infection
- pain
- psychological status
- stress
- activity levels
- diabetes medication
- nutritional intake

Patients should be advised that their blood glucose may be higher than usual post-operatively and this is not a concern if they are feeling well. If they are feeling unwell (particularly if you they are being sick and unable to take food or medication) they should contact their usual diabetes team/GP surgery. There is evidence to suggest that hyperglycaemia results in enhanced inflammation and increased vulnerability to infection and therefore it is reasonable to suggest that blood glucose should be maintained at 6-10mmol/L (4-12 would still be considered acceptable)

Training requirements associated with this Protocol

Mandatory training

There is no mandatory training associated with this policy.

Specific training not covered by mandatory training

Ad hoc training sessions based on an individual's training needs as defined within their annual appraisal or job description.

How this Protocol will be monitored for compliance and effectiveness

The table below outlines the Trusts' monitoring arrangements for this document. The Trust reserves the right to commission additional work or change the monitoring arrangements to meet organisational needs.

Aspect of compliance or effectiveness being monitored	Method of monitoring	Individual responsible for the monitoring	Monitoring frequency	Group or committee who receive the findings or report	Group or committee or individual responsible for completing any actions
<p>All patients with diabetes are under a named Consultant, and the surgical team will be briefed about Diabetes Mellitus management prior to surgery. All activity pertaining to this protocol will be monitored by that Consultant and no formal audit of this Protocol is required.</p> <p>Record-keeping is monitored as part of larger departmental record-keeping audit and reported quarterly to the Quality Team in line with Trust protocol.</p>					

Equality considerations

See MMP001 Control of Medicines Policy.

References

1. NHS Diabetes - Management of adults with diabetes undergoing surgery and elective procedures: improving standards April 2011
2. Medical management of the diabetic patient during podiatric surgery JAPMA vol 84, number 9, sept 1994.
3. British Association of Day Surgery, 2011.
4. NICE pre-op testing June 2003.
5. Hypoglycaemia guidelines, Dr Kath Higgins, June 2011 – United Hospitals of Leicester
6. NICE. surgical site infection 2008.

Document control details

Authors:	Ian Reilly - Consultant Podiatric Surgeon (versions 1-4; 7-8.1) Nicola Donovan - Podiatric Surgery Team (versions 5-6)
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Version No.	Date Ratified/ Amended	Date of Implementation	Next Review Date	Reason for Change (eg. full rewrite, amendment to reflect new legislation, updated flowchart, minor amendments, etc.)
7	22.03.17	22.03.17	31.03.19	Review
8	19.03.19	19.03.19	31.03.22	Review
8.1	05.11.19	05.11.19	31.03.22	Updated monitoring requirements

Appendix 1: Minimum data required from the GP when referring a patient for surgery

PMH

- Duration and type of diabetes
- Place of usual diabetes care (primary or secondary care)
- Other co-morbidities
- Treatment
 - For diabetes - oral agents/ insulin doses and frequency
 - For other co-morbidities

Specific complications of diabetes to consider at assessment

- At risk foot
- Renal impairment
- Cardiac disease

Review/request recent values for

- BMI
- BP
- HbA1c
- eGFR

Appendix 2: Vascular/neurological assessment (Pod Sx team)

Pulses palpable – PT / DP Y / N / weak
Pulses audible with Doppler eg monophasic
CRT < 3secs
ABPI (where necessary) - 1

Vibration perceived Y / N
10g monofilament perceived Y / N

Neurovascular status

REFLEXES Normal / Absent / Clonus

NEUROTIP (sharp/blunt) Present / Absent

128MHz TUNING FORK / 10g MONOFILAMENT

Apex 1st	Present / Absent	Plantar surface of the hallux	Present / Absent
1st MPJ	Present / Absent	1st metatarsal area	Present / Absent
Medial malleolus	Present / Absent	5th metatarsal area	Present / Absent

nb evidence of autonomic neuropathy, causing: diarrhoea, gastroparesis or postural hypotension.

Appendix 3: Hypoglycaemia

Hypoglycaemic episodes are common, particularly with Type 1 Diabetes mellitus (DM) (insulin dependent diabetes) and may also occur in patients with type 2 DM treated with insulin or sulphonylureas (eg gliclazide). Hypoglycaemia is determined by a CBG measurement of <4.0mmol/l.

Glucagon

- Should only be used once during treatment of a hypoglycaemic episode
- Effect will wear off after approx. 30 minutes
- Patients given glucagon will require a larger portion of long acting CHO to replenish glycogen stores
- Glucagon will not be effective in patients with liver disease, glucocorticoid deficiency or who have been malnourished or starved

Suitable long acting carbohydrate (CHO) snack

- 2 biscuits
- 1 slice bread/toast
- 200-300ml milk
- normal meal containing CHO

When the hypoglycaemic episode has been treated

- Document hypoglycaemic episode in patient's notes
- Refer to GP/ Diabetes team and document date referral made.
- Advise patient to check their CBG regularly for the next 24 hours as an episode of hypoglycaemia increases the risk of further hypoglycaemia during this time. Patients with Type 2 diabetes on sulphonylureas may need admitting as the risk of hypoglycaemia can persist for 24-48 hours.

HYPOBOX

Contents	Quantity	Order number
Laminated copy of hypoglycaemia algorithm	1	Provided
Laminated copy of box contents	1	Provided
380ml bottle of Lucozade	3	Supply chain AAR235
Packet of dextrose tablets	2	Pharmacy
Glucogel	3	Pharmacy
Packet of biscuits	3	Supply chain ADC160
Glucagon	1	Pharmacy

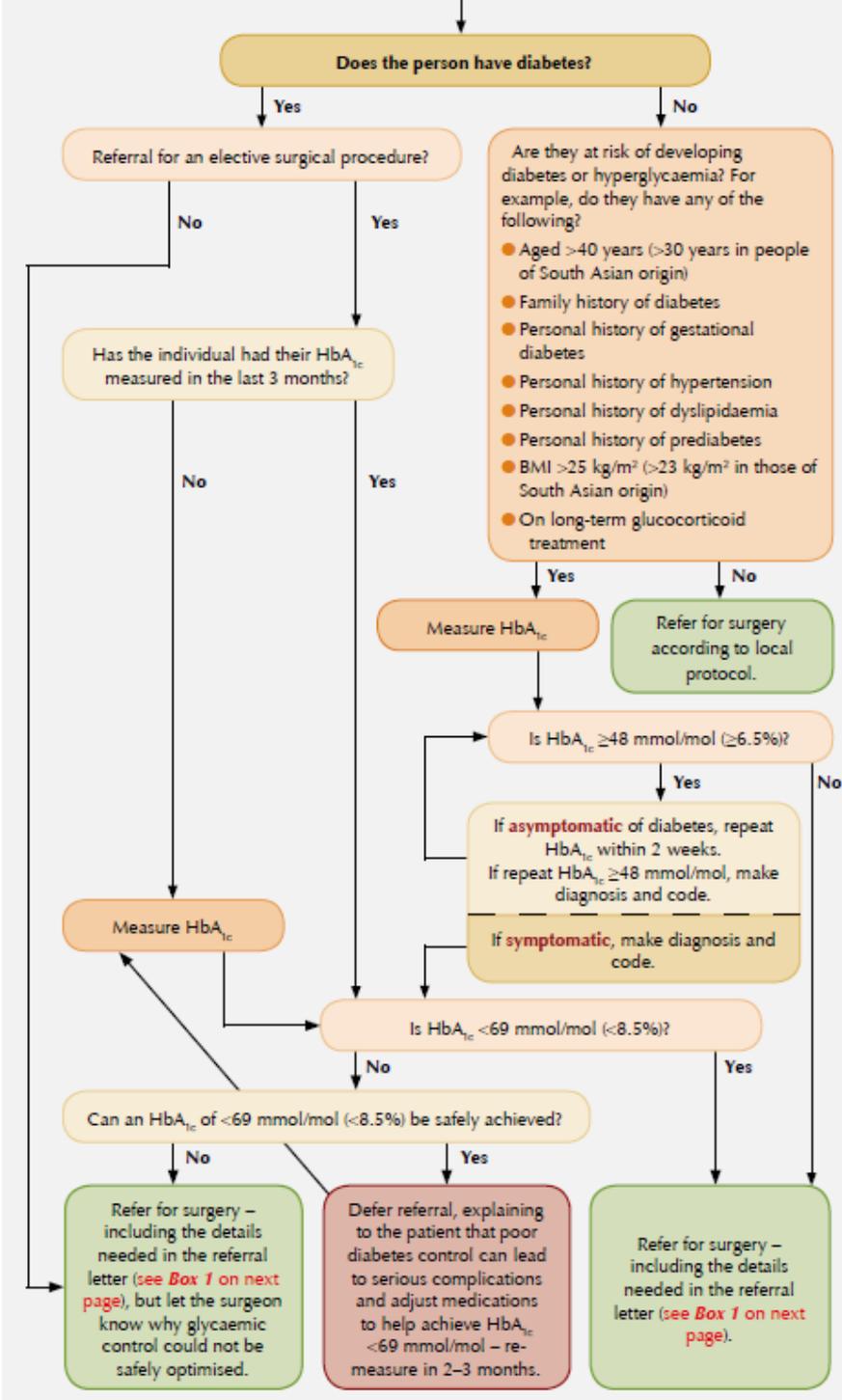
Appendix 4: Management of peri-operative hypoglycaemia

NB patients on diet alone are not at risk of hypoglycaemia and are excluded from this guideline

- Monitor for signs of lowering blood glucose levels (sweating, drowsiness, blurred vision, shaking) and check BM.
- If less than 4-6 mmol/mol and patient has symptoms of hypoglycaemia offer 4 glucose tablets or 150ml (half a can) of sugary drink eg lucozade
- If less than 4mmol/L administer glucagon per PGD guidance.
- Persistent hypoglycaemia should be referred urgently to the diabetic specialist team or the on-call medical team, repeat monitoring after 15 mins



Preparing people with diabetes for surgery



About this series
The aim of the “How to” series is to provide readers with a guide to clinical procedures and aspects of diabetes care that are covered in the clinic setting.

What and why

- Hyperglycaemia in people undergoing surgery is associated with post-operative harm. These harms include post-operative infections, acute kidney injury, acute myocardial infarction or death.
- People referred for elective surgery should have an HbA_{1c} of <69 mmol/mol (8.5%) measured within 3 months prior to referral, if it is safe to achieve this.
- Those at risk of hyperglycaemia – in particular those not known to have diabetes but who are hyperglycaemic – are at particularly high risk. Thus, identifying them prior to referral is important.
- Communication is key. Informing the surgical team that someone has diabetes reduces delays to surgery and post-operative complications. Currently, this is not being done as often as it could be.

Citation: Dhataria K (2018) How to prepare people with diabetes for surgery. *Diabetes & Primary Care* 20: 53–4

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