CLINICAL GUIDELINE FOR THE MANAGEMENT OF ADULT PATIENTS DIABETES MELLITUS DURING SURGERY / ELECTIVE PROCEDURES

For procedures requiring bowel preparation please refer to:
Guidelines for the Care of People with Diabetes requiring bowel preparation

1. Aim/Purpose of this Guideline

This guideline is for the management of Adult patients with Diabetes Mellitus during surgery / elective procedures. It has been benchmarked against national guidance, to provide detailed guidance on the clinical management of Diabetes during surgery in line with best practice guidelines.

2. The Guidance

General Guidance Notes

These guidelines propose a pathway of care for patients undergoing elective surgery and procedures but are also relevant to emergency care.

During surgery / fasting diabetes is managed by the anaesthetist.

Patients with Diabetes should ideally be placed as first on the morning list to reduce the fasting period prior to surgery.

Pre - Operatively

- Where possible, blood glucose levels should be optimally controlled in the pre-operative period. This may necessitate admission to hospital prior to surgery
- Check U&E's, venous blood glucose and HbA1C prior to surgery
- The recommended general targets for surgery are -
- Fasting glucose of 6 – 10 mmol/L HbA1C < 69 mmol/mol (8.5%)
- If HbA1C > 69 mmol/mol (8.5%) refer to GP for diabetes review
- If HbA1C HbA1C > 86 mmol/mol (10%) and Type 1 Diabetes refer to locality DSN

On Admission

Ensure that hypo / hyper treatment is routinely prescribed on admission but not for discharge prescription

Specific Guidance for Bariatric / Colorectal Surgery

- For patients undergoing Bariatric surgery refer to the Bariatric guidelines and the Bariatric Specialist Nurse
- For Patients undergoing Enhanced Recovery receiving Preoperative Nutritional Supplements, omit the pre-operative high carbohydrate drink in people with insulin treated diabetes if a sliding scale insulin infusion is not required
- For Patients undergoing surgery / elective procedures requiring bowel preparation please refer to: Guidelines for the Care of People with Diabetes requiring bowel preparation

These guidelines are for the management of Adults with Diabetes Mellitus whose diabetes is managed with:

A Diet alone

B Oral Hypoglycaemics

C Insulin

D GLP Analogue

- Please refer to the relevant section of the guideline for the patient's current diabetes treatment.

- If the patient is receiving multiple treatments ie insulin and OHA's etc guidance for each therapy needs to be followed

For Additional Advice please refer to the Diabetes In-Patient Specialist Nurse Team via Maxims or bleep 2205
Or
The Endocrine Team via Maxims or the consultant of the week via switchboard

A PATIENTS MANAGED WITH DIET ALONE

Pre Op General Advice

If possible arrange for an AM Operation list

Admission Advice

1. Pre op fasting as per anaesthetist advice.

2. Monitor blood glucose at least 1 hourly pre op from 6 am, 1 hourly during surgery and recovery. (See Clinical guideline for use of Nova Stat Strip blood glucose meter))

3. If blood glucose is <4 mmol/l see guidelines for the management of hypoglycaemia and inform surgical / anaesthetic team

4. If the blood glucose is > 12 mmol/L on 2 separate occasions seek advice from the diabetes team to consider the need for intravenous insulin and fluids and inform surgical / anaesthetic team

5. Recommence diet and fluids post operatively as soon as condition allows

B PATIENTS MANAGED WITH ORAL HYPOGLYCAEMICs

Pre – Operative General Advice

If possible arrange for an AM Operation list

Metformin

If contrast medium is to be used and eGFR < 60 ml/min metformin should be omitted on the day of the procedure and for the following 48 hours
If eGFR < 30 ml/min stop metformin and review

Admission Advice

- If glucose control is suboptimal i.e. < 4 mmol/L or > 12 mmol/L (on 2 separate occasions) gain review of medication and consider referral to the diabetes specialist nurse
- If required Pre op fasting as per anaesthetist advice.
- Monitor blood glucose at least 1 hourly pre op from 6 am, during surgery and recovery (See Clinical guideline for use of Nova Stat Strip blood glucose meter)
- If blood glucose is < 4 mmol/l see guidelines for the management of hypoglycaemia and inform surgical / anaesthetic team
- If the blood glucose is > 12 mmol/l on 2 separate occasions inform surgical / anaesthetic team and consider the need for intravenous insulin and fluids
- Recommence diet and fluids as soon as condition allows

Tablet	Day Prior to Admission	Day of Surgery		
		a.m. surgery	**p.m. surgery**	**If using sliding scale inulin infusion**
Acarbose	Take as normal	Omit morning dose if nil by mouth	Give morning dose if eating	- Stop once infusion commenced - Restart once eating and drinking normally
Meglitinide *(repaglinide or natedlinide)*	Take as normal	Omit morning dose if nil by mouth	Give morning dose if eating	- Stop once infusion commenced - Restart once eating and drinking normally
Metformin (see above)	Take as normal	If taken once or twice a day - take as normal If taken three times a day: - omit lunchtime dose	If taken once or twice a day - take as normal If taken three times a day: - omit lunchtime dose	- Stop once infusion commenced - Restart once eating and drinking normally
Sulphonylurea's	Take as normal	If taken once daily am: - omit the dose If taken twice daily: - omit the morning dose	If taken once daily am: - omit the dose If taken twice daily: omit both doses	- Stop once infusion commenced - Restart once eating and drinking normally
Pioglitazone	Take as normal	Take as normal	Take as normal	- Stop once infusion commenced - Restart once eating and drinking normally
DPP IV Inhibitor	Take as normal	Take as normal	Take as normal	- Stop once infusion commenced - Restart once eating and drinking normally
SGLT-2 inhibitors	Take as normal	Omit on the day or surgery	Omit on the day of surgery	Omit on the day of surgery

C PATIENTS MANAGED WITH INSULIN

Pre – Operative General Advice

If possible arrange for an AM Operation list

Admission Advice

- If glucose control is suboptimal i.e. < 4 mmol/L or > 12 mmol/L (on 2 separate occasions) gain review of insulin and consider referral to the diabetes specialist nurse
- If required Pre op fasting as per anaesthetist advice.
- Monitor blood glucose at least 1 hourly pre op from 6 am, during surgery and recovery (See Clinical guideline for use of Nova Stat Strip blood glucose meter)
- If blood glucose is < 4 mmol/l see guidelines for the management of hypoglycaemia and inform surgical / anaesthetic team
- If the blood glucose is > 12 mmol/l on 2 separate occasions inform surgical / anaesthetic team and consider the need for intravenous insulin and fluids
- Recommence diet and fluids as soon as condition allows

Insulin	Day Prior to Admission	Day of Surgery		
		a.m. surgery	p.m. surgery	If using sliding scale inulin infusion
Once daily evening dose	Take Normal Dose	Normal dose	Normal dose	Normal Dose
Once daily Morning dose	Take Normal Dose	Normal dose	Normal dose	Normal Dose
Twice Daily Insulin	Take Normal Dose	- ½ the morning dose - Usual evening dose	- ½ the morning dose - Usual evening dose	- Stop once infusion commenced until eating and drinking normally - Restart at a meal time once eating and drinking normally (see IV sliding scale chart for advice)
Three times daily mixed insulin	Take Normal dose	- ½ the morning dose - omit the lunchtime dose	- take the usual morning dose - omit the lunchtime dose	- Stop once infusion commenced until eating and drinking normally - Restart at a meal time once eating and drinking normally (see IV sliding scale chart for advice)
Basal Bolus Insulin	Take Normal dose	- background insulin unchanged - Omit the morning and lunchtime rapid acting insulin	- background insulin unchanged - am rapid insulin take the usual dose - lunchtime rapid acting insulin omit	- background insulin continue at the normal dose - omit all rapid acting insulin doses once sliding scale commenced - Restart rapid acting insulin at a meal time once eating and drinking normally (see IV sliding scale chart for advice)

F PATIENTS MANAGED WITH GLP ANALOGUE INJECTIONS

Pre – Operative General Advice

If possible arrange for an AM Operation list

Admission Advice

- If glucose control is suboptimal i.e. < 4 mmol/L or > 12 mmol/L (on 2 separate occasions) gain review of insulin and consider referral to the diabetes specialist nurse
- If required Pre op fasting as per anaesthetist advice.
- Monitor blood glucose at least 1 hourly pre op from 6 am, during surgery and recovery (See Clinical guideline for use of Nova Stat Strip blood glucose meter)
- If blood glucose is < 4 mmol/l see guidelines for the management of hypoglycaemia and inform surgical / anaesthetic team
- If the blood glucose is > 12 mmol/l on 2 separate occasions inform surgical / anaesthetic team and consider the need for intravenous insulin and fluids
- Recommence diet and fluids as soon as condition allows

Frequency	**Day Prior to Admission**	**Day of Surgery**		
		a.m. surgery	**p.m. surgery**	**If using sliding scale inulin infusion**
GLP analogue once daily or twice daily	Take as normal	- If having bowel surgery omit - If not having bowel surgery take as normal	- If having bowel surgery omit - If not having bowel surgery take as normal	- If having bowel surgery omit - If not having bowel surgery take as normal - restart once eating and drinking
GLP -1 once weekly	Take as normal	- If having bowel surgery omit - If not having bowel surgery take as normal	- If not having bowel surgery take as normal - If having bowel surgery omit	- If having bowel surgery omit - If not having bowel surgery take as normal - restart once eating and drinking

3. Monitoring compliance and effectiveness

Element to be monitored	Compliance with the relevant process (A-D above) for patients seen at a Diabetes Team Review.
Lead	Specialist Adult In-Patient Diabetes Team
Tool	Patient Documentation
Frequency	Adult in-patients with diabetes who have had surgery and who are reviewed by the specialist diabetes team
Reporting arrangements	Non compliance will be reported to the responsible surgical team, ward /area manager. Non compliance resulting in an adverse patient event will be reported via Datix
Acting on recommendations and Lead(s)	Surgical teams / ward / area managers will undertake subsequent recommendations and action planning for any or all deficiencies and recommendations within reasonable timeframes for their areas The Specialist Adult In-Patient Diabetes Team will undertake any trust wide recommendations and action planning for any or all deficiencies and recommendations within reasonable timeframes
Change in practice and lessons to be shared	Lesson learned or changes to practice will be shared with all the relevant stakeholders

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Document Title	Guidelines for the management of adult patients with Diabetes Mellitus during surgery / elective procedures					
Date Issued/Approved:	25 November 2016					
Date Valid From:	25 November 2016					
Date for Review:	25 November 2019					
Directorate / Department responsible (author/owner):	Medical Directorate Amanda Veall Lead Clinical Nurse Specialist Diabetes					
Contact details:	01872 253104					
Brief summary of contents	Guidelines for the management of adult patients with Diabetes Mellitus during surgery / elective procedures					
Suggested Keywords:	Diabetes and Surgery					
Target Audience	RCHT		PCT		CFT	
	✓					
Executive Director responsible for Policy:	Medical Director Governance					
Date revised:	April 2016					
This document replaces (exact title of previous version):	Guidelines for the management of Adult patients with Diabetes Mellitus during surgery					
Approval route (names of committees)/consultation:	Diabetes In-Patient Specialist Nurses, Consultant Endocrinologists, Consultant Anaesthetists. Endocrine Governance Meeting.					
Divisional Manager confirming approval processes	Sheena Wallace					
Name and Post Title of additional signatories	Not Required					
Signature of Executive Director giving approval	{Original Copy Signed}					
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet & Intranet	✓	Intranet Only			
Document Library Folder/Sub Folder	Diabetes					
Links to key external standards	DoH:NSF Diabetes 2001 standard 8					

Related Documents:	NHS Diabetes Management of adults with diabetes undergoing surgery and elective procedures:improving standards September 2015
Training Need Identified?	No

Version Control Table

Date	Version No	Summary of Changes	Changes Made by *(Name and Job Title)*
2005	V1.0	Initial Issue	Amanda Veall CNS Diabetes
02 Nov 06	V2.0	Amendment to Metformin as per BNF	Amanda Veall CNS Diabetes
1 May 10	V3.0	Amendment to include GLP analogues	Amanda Veall CNS Diabetes
01 Apr 12	V4.0	Updated to reflect National Guidelines / combine with AM / PM Investigation Guidelines	Amanda Veall CNS Diabetes
17 Mar 14	V4.1	Increase frequency of monitoring pre op to reflect surgical governance issues/ additional of new therapies / National Guidance	Amanda Veall Lead CNS Diabetes
Apr 2016	V 5	Updated to reflect National Guidelines	Amanda Veall Lead CNS Diabetes

Appendix 2.Initial Equality Impact Assessment Screening Form

Name of Name of the strategy / policy /proposal / service function to be assessed (hereafter referred to as *policy*) (Provide brief description):	
Directorate and service area: Medicine	Is this a new or existing Policy? Existing Policy
Name of individual completing assessment: Amanda Veall	Telephone: 01872 253104
1. Policy Aim* Who is the strategy / policy / proposal / service function aimed at?	To provide detailed guidance on the clinical management of Adults with Diabetes during surgery / elective procedures in line with best practice guidelines.
2. Policy Objectives*	• To provide a consistent approach to the management of Diabetes during surgery / elective procedures within RCH sites. • To maintain patient safety and improve outcomes for adult patients with Diabetes during surgery / elective procedures in RCH sites
3. Policy – intended Outcomes*	• Consistent management of Diabetes at RCHT sites. • Prompt and safe management of Diabetes during surgery /elective procedures
4. *How will you measure the outcome?	Audit Datix Reporting Review of surgical / nursing documentation as required
5. Who is intended to benefit from the policy?	All adult patients with diabetes who undergo surgery / elective procedures in hospital within all RCH sites.
6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy? b) If yes, have these *groups been consulted? C). Please list any groups who have been consulted about this procedure.	Yes Yes Diabetes Inpatient Specialist Nurses Consultant Endocrinologists Consultant Anaesthetist

7. The Impact
Please complete the following table.

Are there concerns that the policy **could** have differential impact on:

Equality Strands:	Yes	No	Rationale for Assessment / Existing Evidence
Age		√	
Sex (male, female, trans-gender / gender reassignment)		√	

Race / Ethnic communities /groups		√	
Disability - learning disability, physical disability, sensory impairment and mental health problems		√	
Religion / other beliefs		√	
Marriage and civil partnership		√	
Pregnancy and maternity		√	
Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian		√	

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked "Yes" in any column above and
- No consultation or evidence of there being consultation- this excludes any *policies* which have been identified as not requiring consultation**. or**
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended.	**Yes**	**No**

9. If you are not recommending a Full Impact assessment please explain why.

Signature of policy developer / lead manager / director	Date of completion and submission

Names and signatures of members carrying out the Screening Assessment	1. 2.	

Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust's web site.

Signed Amanda Veall
Date