1. Introduction

This guideline is for all healthcare professionals looking after adult patients who are treated with steroids.

2. Guideline Standards and Procedures

This guideline sets out in a flowchart (see appendix 1) an approach to managing hyperglycaemia and diabetes for all adult inpatients admitted to adult inpatient wards who require steroid treatment.

If staff are unsure regarding the management of such patients despite referral to the guidance then they should seek advice from the specialist diabetes team or a senior colleague.

NOTE: this guidance does not cover the management of hyperglycaemia associated with dexamethasone treatment for people with covid-19 infection. For guidance on this please refer to: www.abcd.care/coronavirus

The Diabetes specialist nurse team can be contacted via ICE (electronic referral) or via switchboard (mobile phone) and this is a 7 day service 9-5pm at LRI and Mon-Fri 9-5pm at LGH and GGH. Diabetes SpR on-call via switch board Mon-Fri 9-5pm. Out of hours medical advice should be via the medical SpR on-call via switchboard.

3. Education and Training

All clinical staff working in any location within UHL would be expected to seek support from a senior peer or member of the diabetes team if they if they were presented with a patient treated with steroids and they did not feel adequately trained to manage the situation.

All medical and nursing staff are required to complete essential to role Insulin Safety training. This training can be accessed via HELM and is renewable on a yearly basis.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Implementation of this guidance in appropriate areas	Case note reviews, datix incident reporting	Dr Kath Higgins, Fiona Adlam	Continous	Report to the Diabetes Inpatient Safety Committee (DISC) – meeting frequency monthly.
All medical and nursing staff	Insulin safety dashboard	Dr Kath	Monthly	As above

are required to complete essential to role Insulin Safety training. This training can be accessed via HELM and is renewable on a yearly basis.	which is presented monthly at DISC and report also to DAPB	Higgins		

5. Supporting References

Joint British Diabetes Societies IP grp: Management of Hyperglycaemia and Steroid (Glucocorticoid) Therapy. May 2021
https://abcd.care/sites/abcd.care/files/site_uploads/JBDS_08_Steroids_DM_Guideline_FINAL_28052021.pdf

Management of hyperglycaemia associated with dexamethasone treatment for people with covid-19 infection. For National please refer to: www.abcd.care/coronavirus

6. Key Words

Steroids, Hyperglycaemia, Diabetes

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Dr Kath Higgins (Clinical Lead for Inpatient Diabetes Care)	**Executive Lead** **Mr Andrew Furlong**
Details of Changes made during review: **N/A**	

Managing glucose control for adult inpatients on steroids (with and without known diagnosis of diabetes)

NHS
University Hospitals of Leicester
NHS Trust

Predisposing factors for hyperglycaemia with steroid therapy:

- Pre-existing type 1 and 2 diabetes
- Impaired fasting glucose or impaired glucose tolerance
- HbA1c - 6-6.5% (42 - 47 mmol/l)
- People previously hyperglycaemic with steroid therapy

Not known to have diabetes:

- Check CBG once prior to starting steroids
- Monitor CBG daily at least once (pre-lunch or pre-tea)
- If **CBG >12mmol/l** increase **CBG testing** to **4x day**
- If **CBG >12mmol/l twice in 24hrs** continue to check **CBG 4x day**, check HbA1c and follow advice in the **green column below**
- Refer to **DSN team via ICE**. Patient may have steroid induced diabetes or a new diagnosis of diabetes

Known Diabetes

- Reassess glucose control and current therapy
- Check CBG on a daily basis 4 x a day and use this flowchart to adjust diabetes medication accordingly.

Glycaemic targets:

- If end of life care or mod/severe frailty aim for **6.7 - 15mmol/l**
- Otherwise aim for **6 - 10mmol/l** (acceptable range 6 - 12mmol/l)

Diet controlled or on oral hypoglycaemic agent (OHA) (Metformin, DPP4, pioglitazone or SGLT2)

Risk of DKA with SGLT2: if patient acutely unwell stop SGLT2, check pH, bicarb and ketones and exclude DKA

- If CBG readings above target pre-evening meal add in Gliclazide 40mg with breakfast
- Increase morning dose by 40mg increments

- If no 'hypos' and taking Gliclazide 240mg and above target
- Consider adding evening dose of Gliclazide or
- Change to intermediate acting insulin (eg, Insuman Basal®) given in the morning - pre-breakfast

Sulphonylurea treated (Gliclazide, Glipizide, Glimepiride, Rapaglinide)

If no 'hypos' and taking less than 320mg/day Gliclazide

- Split dosage of Gliclazide max of 240mg am, 80mg pm if steroids taken once daily in the morning
- If patient is taking steroids more than once a day then split Gliclazide dosage equally with 160mg am and 160mg pm

If no 'hypos' and taking full dose 320mg/day Gliclazide

- Add Insuman Basal® 10 units morning
- Refer to DSN via ICE

If above desired target pre-evening meal

- Increase morning insulin by 4 units
- Review daily
- If remains above target consider increasing insulin dose dependent on risk of overnight 'hypo'
- Increase insulin as per dose amounts box
- Review daily until desired targets reached

Insulin treated alone or in combination with other diabetes treatments

Twice daily insulin:

- If lunchtime & evening meal CBGs are above target increase the am dose of insulin (see insulin dose amounts box)
- If pre-breakfast CBG above target, increase the evening dose of insulin

Basal bolus insulin: (please see bottom of page for suggested dose amounts to increase insulin by)

- Rapid acting insulin may need to be increased to avoid high readings pre-lunch/pre-evening meal
- If fasting CBG is high increase basal insulin

Aim for CBGs according to individual and dependant on risk of 'hypo'.

- If patient is acutely unwell or CBG persistently elevated (>18mmol/l) then follow Hyperglycaemia Decision Support tool.

INSULIN dose amount box

Assuming no 'hypo' and pre-meal CBGs are above identified target increase insulin dose as required.
See below:

- Increase dose by 2 - 5 units if dose below 20 units
- Increase dose by 5 - 10 units if dose 20 - 50 units
- Increase dose by 10 - 20 units if dose 50 - 100 units
- Review daily until stable increasing dose as necessary

Review CBG and insulin doses on a daily basis

1. **When steroids are reduced or discontinued:**
   - **Reduce Gliclazide or insulin in tandem with steroid reduction to avoid hypos and continue to monitor CBG.**
   - **Never stop insulin in Type 1 diabetes.**
2. **If patient discharged and still tapering steroids/hyperglcyaemic/requiring increased doses of diabetes medication then ensure:**
   - **Clear management plan is made with patient/carers before discharge including any planned follow-up arrangement.**
   - **Information is sent to GP. If not know to have diabetes and hyperglycaemia persists after discharge despite stopping steroids then a definitive test for diabetes should be undertaken.**
   - **Patient has BG strips**
3. **For patients diagnosed with steroid induced diabetes whilst in hospital:**
   - **If steroids stopped and CBG return to normal then no further CBG monitoring required but patient will need an HbA1c 3 months after discharge.**

Please contact the Diabetes Specialist Team refer via ICE or Diabetes SpR on-call via switchboard (Mon - Fri 9am - 5pm)

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