Perioperative Management of People with Diabetes and Those on Glucocorticoids

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When in Doubt

• There are usually 2 or 3 consultant ward round EVERY DAY and a consultant diabetologist on call 24/7

• There are THREE Endocrine SpR’s each of whom has a bleep – 0126 / 0669 / 0988

• There are THREE Diabetes Inpatient Specialist Nurses – 0407
Let Me Say That Again

• THERE ARE 17 CONSULTANT LED WARD ROUNDS EVERY WEEK AT THE N&N
There is NO EXCUSE for getting it wrong
Diabetes
Do High Admission Glucose Levels Cause Harm?

3,184 unselected non-cardiac surgical patients in Atlanta, GA
20.2% known to have diabetes
7.9% had hyperglycaemia prior to surgery

Frisch A et al Diabetes Care 2010;33(8):1783-1788
Do High Admission Glucose Levels Cause Harm?

3,184 unselected non-cardiac surgical patients in Atlanta, GA

17.2% of people had hyperglycaemia on the day of surgery (not known to have diabetes)

9.9% had post operative hyperglycaemia

Frisch A et al Diabetes Care 2010;33(8):1783-1788
Patient with diabetes referred for surgery

- Is the operation elective?
  - Yes
  - Will the patient starve for less than 12 hours?
    - Yes
      - Is the HbA1c < 8.5%?
        - Yes
          - Is the patient and procedure suitable as a day case?
            - Yes
              - Book patient for SDAU
            - No
              - Refer patient to GP or diabetes clinic for assessment and stabilisation
        - No
          - Is surgery urgent?
            - Yes
              - Refer to guidelines for IV insulin and dextrose CA1014
            - No
              - Book patient for ward pre op day
    - No
      - Refer to guidelines for IV insulin and dextrose CA1014
- No
  - Book patient for ward pre op day
Different Classes of Non-Insulin Glucose Lowering Agents

• α glucosidase inhibitors
• Metaglinides
• Metformin
• Sulphonylureas
• Thiazolidindiones
• DPP-IV inhibitors
• GLP-1 inhibitors
Fortunately
There is
This.....

Diabetes UK Position Statements and Care Recommendations

NHS Diabetes guideline for the perioperative management of the adult patient with diabetes*


<table>
<thead>
<tr>
<th>Tablets</th>
<th>Day prior to admission</th>
<th>Day of surgery</th>
<th>Patient for AM surgery</th>
<th>Patient for PM surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acarbose</td>
<td>Take as normal</td>
<td>Omit morning dose if NBM</td>
<td>Give morning dose if eating</td>
<td></td>
</tr>
<tr>
<td>Meglitinide (repaglinide or nateglinide)</td>
<td>Take as normal</td>
<td>Omit morning dose if NBM</td>
<td>Give morning dose if eating</td>
<td></td>
</tr>
<tr>
<td>Metformin (procedure not requiring use of contrast media*)</td>
<td>Take as normal</td>
<td>Take as normal</td>
<td>Take as normal</td>
<td></td>
</tr>
<tr>
<td>Sulphonylurea (e.g. Glibenclamide, Gliclazide, Glipizide, etc.)</td>
<td>Take as normal</td>
<td>Once daily AM omit Twice daily omit AM</td>
<td>Once daily AM omit Twice daily omit AM and PM</td>
<td></td>
</tr>
<tr>
<td>Pioglitazone</td>
<td>Take as normal</td>
<td>Take as normal</td>
<td>Take as normal</td>
<td></td>
</tr>
<tr>
<td>DPP IV inhibitor (e.g. Sitagliptin, Vildagliptin, Saxagliptin)</td>
<td>Take as normal</td>
<td>Omit on day of surgery</td>
<td>Omit on day of surgery</td>
<td></td>
</tr>
<tr>
<td>GLP-1 analogue (e.g. Exenatide, Liraglutide)</td>
<td>Take as normal</td>
<td>Omit on day of surgery</td>
<td>Omit on day of surgery</td>
<td></td>
</tr>
</tbody>
</table>
Insulin
<table>
<thead>
<tr>
<th>Insulins</th>
<th>Day prior to admission</th>
<th>Day of surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient for AM surgery</td>
</tr>
<tr>
<td>Once daily (evening) (e.g. Lantus® or Leumin®)</td>
<td>No dose change*</td>
<td>Check blood glucose on admission</td>
</tr>
<tr>
<td>Once daily (morning) (Lantus® or Leumin®)</td>
<td>No dose change</td>
<td>No dose change*. Check blood glucose on admission</td>
</tr>
<tr>
<td>Twice daily (e.g. Novomix 30®, Humulin M3®, Humalog Mix 25®, Humalog Mix 50®, Insuman® Comb 25, Insuman® Comb 50 twice daily Leumin® or Lantus®)</td>
<td>No dose change</td>
<td>Halve the usual morning dose. Check blood glucose on admission. Leave the evening meal dose unchanged</td>
</tr>
<tr>
<td>Twice daily - separate injections of short acting (e.g. animal neutral, Novorapid® Humulin 5®) and intermediate acting (e.g. animal isophane Insulatard® Humulin® Insuman®)</td>
<td>No dose change</td>
<td>Calculate the total dose of both morning insulins and give half as intermediate acting only in the morning. Check blood glucose on admission. Leave the evening meal dose unchanged</td>
</tr>
<tr>
<td>3, 4, or 5 injections daily</td>
<td>No dose change</td>
<td><strong>Basal bolus regimens:</strong> omit the morning and lunchtime short acting insulins. Keep the basal unchanged.* <strong>Premixed AM insulin:</strong> halve the morning dose and omit lunchtime dose Check blood glucose on admission</td>
</tr>
</tbody>
</table>
Other Documents to Help

Joint British Diabetes Societies
Inpatient Care Group
The Management of Diabetic
Ketoacidosis in Adults
March 2010

The Hospital Management of
Hypoglycaemia in Adults
with Diabetes Mellitus
March 2010

Self-management of
diabetes in hospital
Joint British Diabetes Societies
for Inpatient Care Group
How to avoid errors in insulin prescribing.
Welcome to your e-learning module on
The Safe Use of Insulin
Supporting, Improving, Caring

Latest module

The III e-learning module is now available
Click here to access

Are you insulin safe?

Did you know:
- 1 in 5 patients on an inpatient ward has diabetes¹
- Around 4 in 10 patients with diabetes experience a medication error²
- Since 2003 insulin errors have led to over 17,000 safety incidents²
- And, most importantly,

Insulin safety training is now a requirement for all those who prescribe, prepare, handle or administer insulin.

¹ National Patient Safety Agency 2010 Rapid Response Report
² National Database Inpatient Audit 2010: bedside

Other safety e-learning modules

We have also developed a free e-learning module on intravenous insulin infusion and will shortly be publishing two further modules. Find out more by using the links below:

- Intravenous Insulin Infusions – launched in September 2011
- Safe Management of Hypoglycaemia – launching in Summer 2012

Background

In 2010 the National Patient Safety Agency issued a Rapid Response Report showing over 5,000 patient safety incidents were reported between 2003 and 2009 in England and Wales. The figures included one death and one case of severe harm that occurred after clinicians misinterpreted the abbreviation of the term unit. A further three deaths and 17 other incidents occurred between January 2005 and July 2009 where an intravenous syringe was used to measure and administer insulin.

Resources

- Safe use of insulin (CPD material) (Word 2013)
Welcome to the Healthcare e-Academy (www.healthcaree.co.uk) and the NHS Diabetes Suite of safety e-learning modules.

This website has been developed to help you access courses in a more flexible way. Please select the country in which you work or study from the list below.

[Country Selection Buttons]

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Welcome to the Healthcare e-Academy (www.healthcare4u.co.uk) and the NHS Diabetes Suite of safety e-learning modules.

The modules listed above are free of charge to anyone living or working in England. Please note, you will need the following information in order to register:

- NHS Employees: You will need your ESR number to register. Your ESR number can be found on your payslip.
  - What is my ESR number?  View example payslip
- Non NHS Employees: You will need your organisational code to register.
  - What is my Organisational code?

If you have already registered for one module and would like another, please login using your existing login details and simply select the course you want from your "Requested Learning" tab.

If you have forgotten your login details please do not re-register. Please contact us on the details provided below:
Tel: 01943 866586  Email: info@healthcare4u.co.uk

The Safe Use of Insulin  The Safe Use of Intravenous Insulin Infusions  The Safe Management of Hypoglycaemia  The Safe Use of Non-Insulin Therapies for Diabetes

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Please note, if you are already registered as a NHS Diabetes e-learner you will need to re-register to access The Productive Series suite of e-learning. To register please click here.
Glucocorticoids
If in doubt call for help from the endocrine registrar on 1200
Glucocorticoids

• Only an issue if the dose of exogenous steroid are
  – Chronic administration (>3 weeks)
  – Supraphysiological (>7.5 mg/day)

• They upset the normal physiological response to stress by suppressing endogenous adrenal glucocorticoid production
Chronic Glucocorticoid Exposure

- Endocrine and metabolic
  - Suppression of HPA axis (adrenal suppression)
  - Growth failure in children
  - Carbohydrate intolerance
  - Hyperinsulinemia
  - Insulin resistance
  - Abnormal glucose tolerance test
  - Diabetes mellitus
- Cushings syndrome
  - Impotence, menstrual disorders
  - Decreased thyroid-stimulating hormone and triiodothyronine
  - Hypokalaemia, metabolic alkalosis
- Gastrointestinal system
  - Gastric irritation, peptic ulcer
  - Acute pancreatitis (rare)
  - Fatty infiltration of liver (hepatomegaly) (rare)
- Haemopoietic system
  - Leucocytosis
  - Neutrophilia- Increased influx from bone marrow and decreased migration from blood vessels
  - Monocytopenia
  - Lymphopenia- Migration from blood vessels to lymphoid tissue
  - Eosinopenia

- Immune system
  - Suppression of delayed hypersensitivity
  - Inhibition of leucocyte and tissue macrophage migration
  - Inhibition of cytokine secretion or action
  - Suppression of the primary antigen response
- Musculoskeletal system
  - Osteoporosis, spontaneous fractures
  - Aseptic necrosis of femoral and humoral heads and other bones
  - Myopathy
- Ophthalmic
  - Posterior subcapsular cataracts (more common in children)
  - Elevated intraocular pressure or glaucoma
- Neuropsychiatric disorders
  - Sleep disturbances, insomnia
  - Euphoria, depression, mania, psychosis
- Pseudotumor cerebri (benign increase of intracranial pressure)
What is the Fear?

• Precipitating a hypoadrenal crisis intra / post operatively
How Can This be Avoided?

• Planning!

• For minor surgery (local / minimal physiological upset) – just double oral steroid dose for the day of the procedure and for 2-3 days afterwards
For More Invasive Procedures

• If they are to be NBM
  – i.v. hydrocortisone 50 mg tds for ‘medium’ procedures with short periods of NBM
  – i.v. hydrocortisone 100 mg tds for the major procedures
  – To stay on these doses until they are eating and drinking

• However....
However....

- If they are NBM for a long time and their physiological parameters are better, then reduce dose of HC
Once They Are Eating and Drinking

• Back to oral HC – at double their standard dose for a few days

• Then back to usual maintenance dose

• If in doubt call the endocrine team who will come and review the patient with their registrar or consultant that day or the next
Remember

• There are 17 consultant wards rounds per week
• The endocrine registrar is available on bleep 1200
• The Diabetes Inpatient Specialist Nurse is available on bleep 0407
• When in doubt call for help
You don’t want to contribute to this
Any questions?