Aim

To provide clinical staff with the information necessary to ensure the safe management of women who are receiving corticosteroids during pregnancy.

Background

Corticosteroids, most commonly Betamethasone, are used in women anticipated to deliver preterm in order to reduce perinatal mortality and the incidence and severity of respiratory distress in neonates.

Unfortunately, there are frequently maternal side effects from this therapy, the most concerning of which is the induction of hyperglycaemia due to increased insulin resistance (1, 2). Steroid administration may induce clinically significant hyperglycaemia during pregnancy in women with or without gestational diabetes as well as in women with pre-existing type 1 or type 2 diabetes. If the hyperglycaemia occurs close to delivery it may increase the risk of neonatal hypoglycaemia (3, 4) and hyper bilirubinaemia. (5) The risk of these complications may be reduced by strict maternal glycaemic control during Betamethasone administration.

Administering Corticosteroids to women with Diabetes

Diabetic Ketoacidosis may be precipitated by corticosteroid administration in women with Type 1 or Type 2 diabetes mellitus (DM) and gestational diabetes mellitus (GDM) (6, 7). Betasymphathomimetic agents such as terbutaline should be avoided if possible during the period of steroid administration as they may exacerbate steroid induced hyperglycaemia (8).

The risk of ketoacidosis is increased especially in pregnant women with poorly controlled T1DM. Ideally, these women should be admitted to hospital when steroids are to be given. In high risk cases an insulin/dextrose infusion may be considered at the discretion of the diabetes physician/ team. Therefore, a low threshold of suspicion of the presence of DKA /and appropriate subsequent action is required.
Glycaemic management in women receiving corticosteroids

- Where possible, give antenatal corticosteroids as early in the day as possible. All women who are to receive antenatal corticosteroids require a baseline blood glucose level (BGL) prior to the administration of the first dose. If the baseline glucose level is > 7.0mmol/L the diabetes physicians or educators should be notified and admission should be considered.

- Dietary advice will be provided to assist women receiving corticosteroids to limit their carbohydrate intake for the 3 days following steroid administration. All women receiving antenatal corticosteroids as an inpatient should have a 4 point blood glucose profile (before breakfast and after all meals).

1. Management of women who have not had an Oral Glucose Tolerance Test (OGTT) in pregnancy

Risk Factors for GDM
- Previous GDM
- Ethnicity: Asian (including Indian), Aboriginal, Pacific Islander, Maori, Middle Eastern, non-white African
- Maternal age > 40 yrs
- Family history DM (1st degree relative with DM including a sister with GDM)
- Obesity, especially if BMI > 35kg/m²
- Hypertension prior to 20 weeks
- Previous macrosomia (baby with birth weight more than 4000g
- History of unexplained stillbirth
- Previous baby with congenital abnormalities
- Polycystic ovarian syndrome
- Medications: corticosteroids, antipsychotics

Any woman may be tested for diabetes at any time in pregnancy if there is clinical suspicion based on symptoms or other factors such as heavy glycosuria, fetal macrosomia and polyhydramnios.

a) No risk factors for gestational diabetes
Women who have not yet had a glucose tolerance test in pregnancy but who have no risk factors for gestational diabetes should have a baseline blood glucose level prior to the administration of each dose of steroids and if this is <6mmol/l receive written dietary advice only.

b) Risk factors for gestational diabetes
Women who have not yet had a glucose tolerance test in pregnancy but who have risk factors for gestational diabetes should have their blood glucose levels monitored
following steroid administration and carbohydrate restriction and/or insulin therapy if required.

2. Normal glucose tolerance test
Women who have had a normal glucose tolerance test in the current pregnancy should have a baseline blood glucose level prior to the administration of each dose of steroids and if this is <6 mmol/l receive written dietary advice only.

3. Diet controlled gestational diabetes
Women with diet controlled gestational diabetes should have their carbohydrates restricted for 72 hours following the first dose of steroids and insulin commenced if necessary as indicated by blood glucose monitoring.

4. Gestational diabetes requiring insulin
These women should have their insulin doses increased by at least 50% over baseline from 4 hours after the first dose of steroids until 48 hours after the second dose of steroids. The insulin doses may require doubling or more during this period.
5. Type 1 or type 2 diabetes

*The diabetes physicians or educators are to be notified of any woman with Type 1 or Type 2 DM who is to receive corticosteroids.*

- Women with Type 1 or Type 2 DM should have a 02:00 hrs (2am) level checked in addition to pre and postprandial blood glucose levels.
- Insulin dose adjustment will be required and consideration should be given to commencement of an insulin infusion. (9). Women on insulin pumps should have both basal rates and insulin: carbohydrate ratios increased.

**Do not discontinue pump therapy in these women.**

- An increase in insulin doses of at least 30 – 50% is usually required and is more effective if initiated prior to the rise in blood glucose levels. (10)
- Women with type 1 DM should have a baseline blood ketone level performed prior to the administration of corticosteroids. Blood ketones are then rechecked daily or more frequently if the patient is unwell or the blood glucose level is > 10.1mmol/L and also prior to the administration of a 2nd dose of corticosteroids.
- *The diabetes physicians should be notified immediately if blood ketone levels are elevated > 0.6 mmol/L*

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### References and resources

3. Stenninger et al., 1997
# Related WNHS policies, procedures and guidelines

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<thead>
<tr>
<th>Patient information Leaflet: Celestone and Diet- Inpatients</th>
<th>Patient information Leaflet: Celestone and Diet- MFAU</th>
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