OBSTETRICS AND GYNAECOLOGY CLINICAL PRACTICE GUIDELINE	
# Corticosteroids: Antenatal Use of	
Scope (Staff):	Clinical staff
Scope (Area):	Obstetrics areas
This document should be read in conjunction with the Disclaimer.	

Contents

Aim

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

Dosage and administration of course of antenatal corticosteroids

Administer one dose of Betamethasone (Celestone Chronodose) 11.4mg by intramuscular injection and repeat this dose 24 hours later.

Note:

- 1 dose = 11.4 mg intramuscular injection i.e. 2 ampoules of Betamethasone (Celestone Chronodose)
- 1 course = a total of 2 doses which are given 24 hours apart.

Key points

1. Administration of a single course of antenatal corticosteroid therapy should be offered to **all women** between 23 to 36^{+6} weeks gestation at risk of preterm delivery.

   Note: This guideline does not apply to **women with pre-existing diabetes** (Type 1 and Type 2 Diabetes) who are **at risk of a late preterm birth (34 – 36+6**). There is poor or no evidence of any benefit in this subgroup and significant risks to the mother, fetus and the newborn.

   In women with Gestational Diabetes and at risk of late preterm birth (34-36+6) the decision to administer corticosteroids should be made at a senior level and with careful considerations of the risks and benefits. The evidence of benefit of antenatal corticosteroid in this subgroup comes from a small number of cases and is not very strong. There are strict dietary restrictions and careful regular monitoring of blood sugar protocols to be followed if the decision is made to proceed with the administration.

2. Unless birth is imminent, even if one dose is anticipated, a course of antenatal corticosteroids should be commenced for all women at risk of pre-term birth.[1, 2]
3. If there are no contra-indications for tocolysis it should be considered to allow time for a completed course of antenatal corticosteroid therapy[1] for gestations under 34 weeks only. The extension of steroid use to 36^{+6} weeks does **not** mean that KEMH recommends tocolytic therapy past 34 weeks.
4. Women with preterm rupture of membranes should be offered a course of corticosteroid therapy provided there are no clinical signs of infection.[1, 3]
5. Antenatal corticosteroid therapy is contraindicated in a woman with a systemic infection including tuberculosis. Caution is required if chorioamnionitis is

suspected. Consultation with the team Consultant should occur in this circumstance.

6. Currently there is inconclusive evidence about the dosage and benefits of antenatal corticosteroid administration in multiple pregnancies.[10,4] Corticosteroid administration to late preterm multiple pregnancies must be discussed with the team consultant prior to prescription and administration.
7. Multiple doses of antenatal corticosteroids have been shown to reduce the incidence of neonatal RDS, and evidence does not show any harm in early childhood[5]. However, long-term risk and benefits for the woman or infant is unknown so is currently not recommended at KEMH.
8. The administration of antenatal corticosteroids to reduce the risk of RDS if a planned elective caesarean section (ELUSCS) is arranged between 37- 39 week gestation, is debated. The team Consultant should be involved in the decision.

Background information

In 1972 a study demonstrated that a single course of antenatal corticosteroids treatment may enhance fetal maturation before preterm birth and decrease the rate of respiratory distress syndrome, intraventricular haemorrhage and neonatal death.[6-8] This treatment results in less neonatal mortality, fewer common neurological and abdominal complications such as cerebroventricular haemorrhage and necrotising enterocolitis. There does not appear to be any negative effects from the corticosteroid for the mother, and long-term outcomes on both the baby and the mother are good.[8]

The use of antenatal steroid are most effective in reducing the incidence of respiratory distress syndrome in pregnancies that deliver 24 hours after and up to 7 days after administration of the second dose of antenatal corticosteroids.[2, 8]

A randomised trial done in 2005 found that if antenatal corticosteroids were administered prior to a planned elective caesarean section (ELUSCS) between 37-39 weeks the incidence of respiratory distress can be reduced by more than 50%.[9] The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) suggest this should be considered by practitioners.[10]

Randomised long-term evidence of safety would be required before support would be given to courses beyond the first two doses. Repeated dose(s) of corticosteroid reduces neonatal respiratory distress syndrome (RSD). However, at birth infants exposed to repeated corticosteroids showed a reduction in some measures of growth, although by the time of discharge and later follow-up in childhood no differences were seen in weight, head circumference and height. There is still insufficient evidence regarding longer-term benefits of multiple courses of antenatal corticosteroids.[2, 8, 11] Animal studies have shown neurological developmental deficits

in newborns following multiple courses of antenatal steroids compared to a single dose.[12]

A single “rescue” course of antenatal corticosteroids administered prior to 33 weeks gestation improves neonatal outcomes and has not been shown to increase any short term risks.[13] Recent research also shows that administration to women at risk of late preterm birth (34-36 weeks) reduces neonatal respiratory complications.[14]

When administering antenatal corticosteroid practitioners should be aware of the short term effect on the fetus including a reduction in fetal heart rate variability, and also fetal body movements and breathing activity may be reduced for 2-3 days.[12]

Administering corticosteroids to women with Diabetes

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[15, 16]. 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[14, 17] and hyper bilirubinaemia.[18] The risk of these complications may be reduced by strict maternal glycaemic control during Betamethasone administration.

Diabetic Ketoacidosis may be precipitated by corticosteroid administration in women with Type 1 or Type 2 diabetes mellitus (DM) and gestational diabetes mellitus (GDM) [19, 20]. Betasympathomimetic agents such as terbutaline should be avoided if possible during the period of steroid administration as they may exacerbate steroid induced hyperglycaemia[21].

The risk of ketoacidosis is increased especially in pregnant women with poorly controlled T1DM. Ideally, women with pre-existing diabetes 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 when 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).

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.

Normal glucose tolerance test

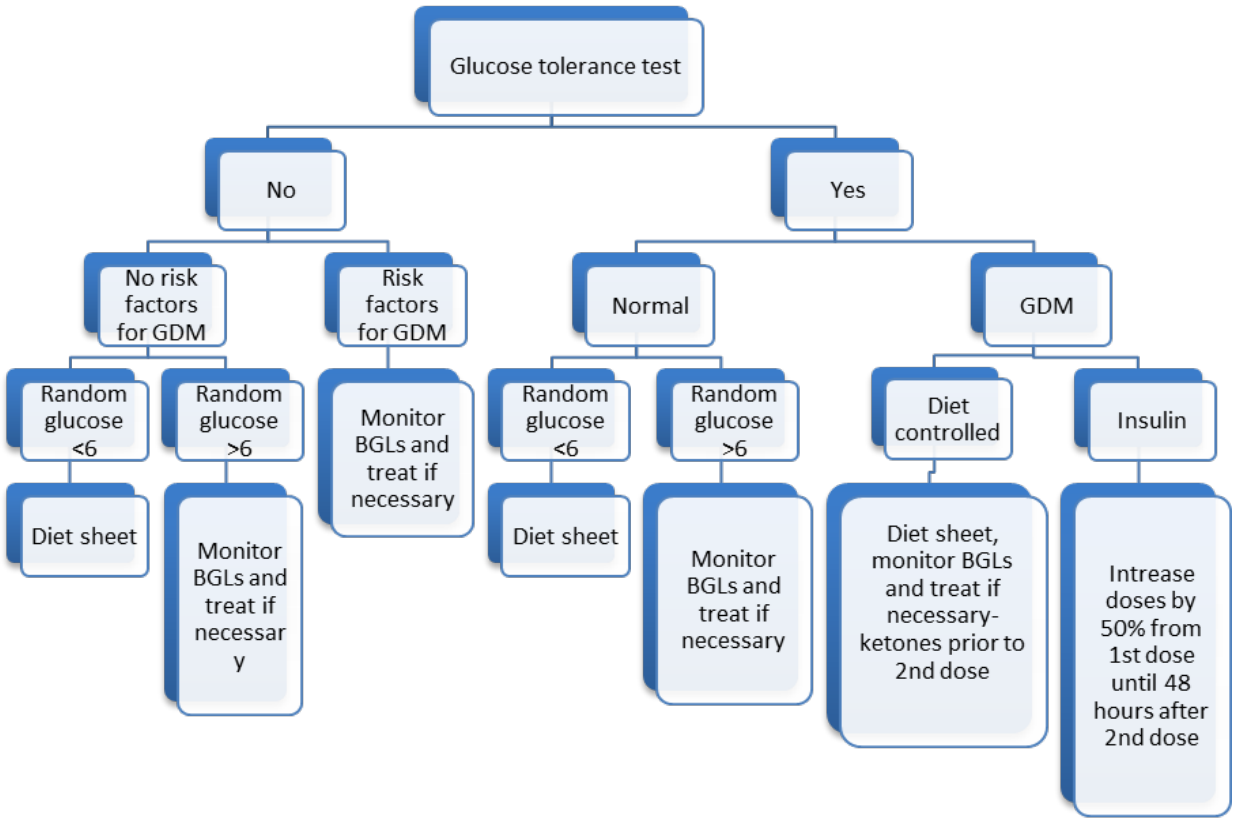
Women who have had a normal glucose tolerance test in the current pregnancy should have a baseline blood glucose level prior to the administration of each dose of steroids and if this is <6 mmol/l receive written dietary advice only.

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.

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.



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.[22] 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.[23]
- 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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Related WNHS policies, procedures and guidelines

- Obstetrics and Gynaecology Clinical Practice Guideline - Preterm Birth Prevention: Low Risk Women
- Obstetrics and Gynaecology Clinical Practice Guideline - Preterm Birth Prevention: Moderate Risk Women
- Obstetrics and Gynaecology Clinical Practice Guideline - Preterm Birth Prevention: High Risk Women
- Obstetrics and Gynaecology Clinical Practice Guideline - Rupture of Membranes – Spontaneous (Previable, Preterm and Term)
- Obstetrics and Gynaecology Clinical Practice Guideline – Preterm Labour

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Version History

Version Number	Date	Summary
1.0	September 2001	First version
	January 2017	Revised version
	February 2018	Revised version
	August 2024	Clinical decision by Executive to extend review date by 12 months

The health impact upon Aboriginal people has been considered, and where relevant incorporated and appropriately addressed in the development of this policy.

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