OBSTETRICS AND GYNAECOLOGY
CLINICAL PRACTICE GUIDELINE

Vitamin D Deficiency in Pregnancy

Scope (Staff):	Clinical staff
Scope (Area):	Midwifery and Obstetrics

This document should be read in conjunction with the Disclaimer.

Quick Reference Guide

Women offered screening[1]

- Women with limited exposure to sunlight (e.g. because they are predominantly indoors or usually protected from the sun when outdoors or prolonged hospitalisation)
- Dark skin
- A pre-pregnancy BMI ≥ 40[2]

Screening Test

- At first antepartum visit if at risk and has no current status available.

  Screening can also be conducted at any stage of pregnancy if previously missed.

  25 (OH) vitamin D serum level once off

Supplementation

See Pharmacy Clinical Guideline Cholecalciferol for dosage and forms of supplementation

- 30-49nmol/L: 1000 IU / day
- < 30 nmol/L: 2000 IU / day plus calcium (RDA) orally. (E.g. Bio-Logical Vitamin D3 Solution 1000iu/0.2mL) for 6 weeks.
- Maintenance dose of 1000 IU recommended at least until the cessation of lactation. Repeat vitamin D blood test is not required.

Results

Serum levels above 78nmol/L – ideal

50 nmol/L – normal

30 – 50 nmol/L – insufficiency (mildly deficient)

<30 nmol/L – deficiency (severe vitamin D deficiency) – needs immediate follow up

Recommended calcium daily intake

	Age	Calcium (mg)
In Pregnancy	14-18 years	1300
	19-50 years	1000

Aim

- To identify women at risk for vitamin D deficiency and initiate screening.
- To provide information on sunlight exposure and dietary requirements to maintain normal levels and to implement the management of vitamin D supplements for vitamin D deficient women.

Key Points

1. All women identified as at risk of vitamin D deficiency should be screened in pregnancy at the first presentation to WNHS, or any time in pregnancy if screening has been missed. Vitamin D deficient women should be offered vitamin D3 supplementation daily for six weeks. The vitamin D level is not routinely rechecked.
2. A maintenance dose of vitamin D3 should be continued.
3. Inform the paediatrics team of any neonates born to vitamin D deficient mothers, or mothers with risk factors for vitamin D deficiency.

Risks Associated with Vitamin D Deficiency in Pregnancy[1]

Maternal vitamin D deficiency in pregnancy is associated with:

- low serum calcium in the newborn, with or without convulsions
- rickets and
- defective tooth enamel.

Effects on fetal growth have also been associated with maternal vitamin D deficiency. Population-based studies have found:

- lower birth weights and a higher risk of being small for gestational age
- lower neonatal bone mineral accrual to be lower in the vitamin D deficient groups, although bone mineral density differences were not statistically significant ; and
- greater femoral metaphyseal cross-sectional area and a higher femoral splaying index at 19 and 34 weeks pregnancy, suggesting that maternal vitamin D deficiency can influence fetal femoral development as early as 19 weeks pregnancy.

Low maternal vitamin D concentrations may also affect the function of other tissues, leading to a greater risk of multiple sclerosis, cancer, insulin-dependent diabetes mellitus, and schizophrenia later in life and may influence early-life respiratory health.[1]

Population to be Offered Screening

Antenatal women who:

- have limited exposure to sunlight (e.g. because they are predominantly indoors or usually protected from the sun when outdoors,[1] or prolonged hospitalisation)
- have dark skin[1]
- have a pre-pregnancy BMI ≥40. [2] A high BMI (≥40) is associated with a 24% decrease in serum 25 (OH) vit D levels than people with a BMI <25.[2]

When deciding whether to screen, consider these factors, season and climate.[1]

Screening Tests

1. Arrange screening for the woman at the first antepartum visit if she is at risk of vitamin D deficiency and has no current status available. Screening can also be conducted at any stage of pregnancy if previously missed.
2. Screening tests offered should include: 25 (OH) vitamin D serum level
   - Serum levels above 78nmol /L are ideal
   - 50nmol/L is considered normal
   - 30-50 nmol/L is considered vitamin D insufficiency (mildly deficient)
   - Levels below 30nmol/L show deficiency (severe vitamin D deficiency) and need immediate follow up

Supplementation of Vitamin D Deficient Women

See Pharmacy Cholecalciferol for dosage and forms of supplementation.

Pregnant women with Vitamin D levels <50nmol/L:

1. Levels 30-49 nmol/L: 1000IU (25 µg) / day[3] plus calcium* (RDI)
2. Levels <30 nmol/L: 2000IU (50 µg) / day[3] plus calcium* (RDI) orally (e.g. Bio-Logical Vitamin D3 Solution 1000iu/ 0.2mL)
3. After 6 weeks of treatment, a maintenance dose of 1000 IU is recommended. However, the vitamin D level is not required to be rechecked.

Pregnant women with Vitamin D level above 50nmol/L to take 400 IU vitamin D daily as part of a pregnancy multivitamin.[3]

* A recent Cochrane review found vitamin D supplementation can reduce the risk of pre-eclampsia, low birth weight and preterm birth, however when combined with calcium supplementation, risk for preterm birth increased.[4] The RDI table below shows the total calcium amount recommended for all pregnant and lactating women taking into consideration all intake sources (e.g. food, vitamins).

Australian Calcium Recommended Daily Intake (RDI)

	Age	Calcium (mg)
Pregnant[3,5]	14 – 18 years	1300
	19 – 50 years	1000
Lactating[5]	14 – 18 years	1300
	19 – 50 years	1000

Oral supplementation should be the first line treatment. However alongside supplementation to treat the deficiency, education about adequate sun exposure is important. Measures to prevent sunburn, dehydration and skin cancer lead to less exposure to the sun and the use of sunscreens can lower vitamin D concentrations.

Exposure to at least 15-30 minutes of sunshine per day is recommended, avoiding 1100-1500hr (1700hr in the summer months) to increase vitamin D production.

Hands, face and both arms need to be exposed to the sun for adequate vitamin D synthesis. However, deeply held religious, cultural and personal beliefs about modesty and sun avoidance need to be respected. A yellow patient information card on Vitamin D is available in antenatal clinic to provide to vitamin D deficient women.

Diet

Dietary sources of both calcium and vitamin D along with their bioavailability must be considered. Good dietary sources of calcium are milk and milk based foods, but it is also available from alternative non-dairy sources such as bony fish, some fruits and nuts and now in fortified soy beverages and breakfast cereals. Dietary vitamin D is found in small amounts in foods and cannot be relied upon when sun exposure is inadequate. Best sources are fish, margarine and eggs.

Advice Regarding Family Screening

If a woman is identified with vitamin D deficiency she should be advised to have other family members (particularly children) to be checked for vitamin D deficiency.

Breastfeeding and Vitamin D Deficiency

See Neonatal Postnatal wards Guideline Maternal Vitamin D Deficiency

References and resources

1. Australian Health Ministers' Advisory Council. Clinical practice guidelines: Antenatal care. Canberra: Australian Government Department of Health and Ageing; 2024. Available from: https://app.magicapp.org/?language=en#/guideline/jm83RE
2. Konradsen S, Ah H, Lindberg F, Hexeberg S, R. J. Serum 1,25-dihydroxy vitamin D is inversely associated with body mass index. Eur J Nutr. 2008;47(2). Available from: http://www.ncbi.nlm.nih.gov/pubmed/18320256

References and resources

3. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. C-Obs 25: Vitamin and mineral supplementation and pregnancy. RANZCOG. 2015.
4. De-Regil LM, Palacios C, Lombardo LK, Peña-Rosas JP. Vitamin D supplementation for women during pregnancy (review). Cochrane Database of Systematic Reviews. 2016(1). Available from: http://dx.doi.org/10.1002/14651858.CD008873.pub3
5. 5. National Health and Medical Research Council., New Zealand Ministry of Health. Calcium: NHMRC / NZ Ministry of Health; 2014. Available from: https://www.nrv.gov.au/nutrients/calcium

Related WNHS procedures and guidelines

Pharmacy Adult Medication Guideline: Cholecalciferol

Neonatal Postnatal Wards Guideline Maternal Vitamin D Deficiency

WNHS Patient Brochure: Colecalciferol for Vitamin D Deficiency

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Version History

Version Number	Date	Summary
1.0	July 2007	First version
	July 2016	Revised version
	August 2024	Clinical decision by Executive to extend review date by 6 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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