



Clinical Practice Guideline Vitamin D Deficiency during Pregnancy Peninsula Care Goal Safe

Target Audience

Medical, midwifery and nursing staff providing antenatal care to women.
Antenatal patients.

Purpose

To provide women evidence-based advice on the investigation and management of vitamin D deficiency during pregnancy.

To improve maternal and neonatal outcomes in women identified as vitamin D deficient.

Guideline

Vitamin D, synthesised in the skin and obtained through diet, is necessary for skeletal growth and development. Vitamin D is also being recognised for roles in “non-bone mineralisation effects” such as glucose metabolism and immune modulation. During pregnancy, vitamin D is transplacentally transferred to the fetus and neonatal levels are reflective of maternal levels.

Risk factors for vitamin D deficiency

Sunlight is our major source of vitamin D, with only 10% of our requirement obtained through diet. Women at higher risk of vitamin D deficiency include those with (NICE UK, 2017);

- limited skin-exposure to sunlight, such as veiled women or house-bound
- darker skin (particularly African, African-Caribbean, Asian and South Asian) as their skin is less efficient at synthesising vitamin D.
- an obese pre-pregnancy body mass index ($BMI \geq 30 \text{ kg/m}^2$)
- a diet low in vitamin D source foods (e.g. egg yolk, red meat, oily fish, fortified margarine and breakfast cereal).
- malabsorption syndromes (cystic fibrosis, coeliac disease, inflammatory bowel disease)
- certain medications (including isoniazid, rifampicin, anticonvulsants)
- mothers of infants with rickets (RANZCOG, 2004)

Vitamin D deficiency

- Vitamin *deficiency* is thought to relate to a level of $<50\text{nmol/L}$ with *insufficiency* existing at levels from $50\text{--}75\text{nmol/L}$ (Holick, 2007)
- Routine screening for vitamin D deficiency is not supported by the available evidence as being clinically or financially effective. If vitamin D levels have been performed by referring practitioners it should be noted that there is a lack of consensus on the ideal level of vitamin D.

Pregnancy and Maternal Implications of Vitamin D deficiency

There are reported **associations** between Vitamin D deficiency and adverse pregnancy outcomes. When counselling women with respect to the impact of Vitamin D on their pregnancy health, one should be cognisant that these are associations only, and there is no statistically significant evidence of causation to date. Pregnancy outcomes associated with vitamin D deficiency include;

- Pre-eclampsia
- Gestational diabetes
- Caesarean section

Maternal implications for later life include;

- Osteomalacia/osteoporosis

PROMPT doc no: 130911 Version: 6.0		
First created: 10/07/2015	Page 1 of 4	Last reviewed: 05/10/2023
Version changed: 05/10/2023	UNCONTROLLED WHEN DOWNLOADED	Next review: 05/10/2026



Clinical Practice Guideline Peninsula Care Goal

Vitamin D Deficiency during Pregnancy Safe

- Schizophrenia
- Insulin dependent diabetes
- Cancer
- Multiple sclerosis

Neonatal and Childhood Implications of Vitamin D deficiency

Vitamin D is available to a developing fetus through transplacental passage and neonatal levels are reflective of maternal levels. Neonatal and childhood consequences of vitamin D deficiency include;

- Preterm birth
- Impaired skeletal development
- Hypocalcaemia and hypocalcaemic seizures
- Osteomalacia
- Diabetes
- Multiple sclerosis
- Atopic illnesses
- Rickets in severe cases

Vitamin D supplementation

- Women should have their risk factors for vitamin D deficiency assessed and documented at their booking visit.
- Vitamin D supplementation should be discussed with all women and highly recommended with those identified as being at high-risk of vitamin D deficiency (see above).
- There is a lack of consensus about the appropriate dose of vitamin D. Guidelines range from 400 IU to 5000 IU per day for all women. It is likely that doses under 4000 IU/day are safe (IoM 2010)
 - Most pregnancy multivitamin supplements contain a daily dose of 500 IU (12.5mcg) eg 'Elevit', 'Blackmores Gold'. This is in keeping with UK guidelines (NICE 2017, 400 IU/day) and the USA Institute of Medicine (IoM 2010, 600 IU/day).
 - Higher doses (1000 IU) are available as single vitamin D supplements (e.g. 'Ostelin Vitamin D', 'OsteVit D' or 'Blackmores Vitamin D3').

Key Aligned Documents

- [Vitamin D Administration](#) Peninsula Health recommended supplementation for Neonates

Evaluation

Regular document revision and review of relevant VHIMS/RiskMan Reports.

References

- 1) Amegah, AK, Klevor MK, Wagner CL. (2017). **PLoS ONE**. Maternal vitamin D insufficiency and risk of adverse pregnancy and birth outcomes: A systematic review and meta-analysis of longitudinal studies. **PLoS ONE; 12 (3): 1-22**.
- 2) Davies-Tuck M, Yim C, Knight M, Hodges R, Doery JCG, Wallace E. (2015). **Vitamin D testing in pregnancy: Does one size fit all?** *Australian & New Zealand Journal of Obstetrics & Gynaecology; 55 (2): 149-155*.
- 3) Department of Health and Human Services (2017), Vitamin D Deficiency in Neonates,

PROMPT doc no: 130911 Version: 6.0		
First created: 10/07/2015	Page 2 of 4	Last reviewed: 05/10/2023
Version changed: 05/10/2023	UNCONTROLLED WHEN DOWNLOADED	Next review: 05/10/2026



Clinical Practice Guideline Vitamin D Deficiency during Pregnancy Peninsula Care Goal Safe

- 4) <https://www2.health.vic.gov.au/hospitals-and-health-services/patient-care/perinatal-reproductive/neonatal-e-handbook/conditions/vitamin-d-deficiency>.
- 5) Holick M. (2007). Vitamin D Deficiency. *New England Journal of Medicine*;357:266-81.
- 6) Huynh J, Lu T, Liew D, Doery JC, Tudball R, Jona M, Bhamjee R. and Rodda CP. (2017), Vitamin D in newborns. A randomised controlled trial comparing daily and single oral bolus vitamin D in infants. *J Paediatr Child Health*, 53: 163–169
- 7) Institute of Medicine of the National Academies (US). Dietary reference for intakes for calcium and vitamin D. Washington DC. National Academy Press; 2010
- 8) Ketha H, Wadams H, Lteif A, Singh RJ. (2015). Iatrogenic vitamin D toxicity in an infant – a case report and review of literature. *The Journal of Steroid Biochemistry and Molecular Biology*; 148: 14-18.
- 9) Kovacs C (2008), Vitamin D in pregnant and lactation; maternal, fetal, and neonatal outcomes from human and animal studies, *Am J Clin Nutr*, 88(suppl): 520S-8S
- 10) Munns C, Zacharin MR, Rodda CP, Batch JA, Morley R, Cranswick NE, et al. Prevention and treatment of infant and childhood vitamin D deficiency in Australia and New Zealand: a consensus statement. *Med J Aust*. 2006;185(5):268-72.
- 11) National Institute for Health and Clinical Excellence (August, 2017) Vitamin D: supplement use in specific population groups. PH 56. London: National Institute for Health and Clinical Excellence
- 12) <https://www.nice.org.uk/guidance/ph56/>
- 13) Preventing Skin Cancer. Sun Protection and Babies (2018). Cancer Council Australia.
- 14) <https://www.cancer.org.au/preventing-cancer/sun-protection/preventing-skin-cancer/>
- 15) Royal Australian and New Zealand College of Obstetrics and Gynaecology (November, 2014) [Vitamin and mineral supplementation in pregnancy. C-Obs-25](#).
- 16) Royal Children's Hospital Clinical Practice Guideline, publication date unknown,
- 17) https://www.rch.org.au/clinicalguide/guideline_index/Vitamin_D_deficiency/#risk
- 18) Website accessed 2nd October 2017
- 19) Royal College of Obstetricians and Gynaecologists. Vitamin D in Pregnancy (Scientific Impact Paper No.43). 2014. Available from https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/vitamin_d_sip43_june14.pdf.
- 20) Wagner CL and Hollis, BW. (Sep 2017). Vitamin D supplementation during pregnancy: Improvements in birth outcomes and complications through direct genomic alteration. *Molecular & Cellular Endocrinology*; 453: 113-130.
- 21) Wagner CL, Greer FR (Nov 2008), Prevention of Rickets and Vitamin D Deficiency in Infants, Children and Adolescents, *Pediatrics*, 122(5) 1142-1152
- 22) Wolsk, HM. (2017). [Prenatal vitamin D supplementation reduces risk of asthma/recurrent wheeze in early childhood: A combined analysis of two randomized controlled trials. PLoS One; 12 \(10\).](#)
- 23) Yu CK, Sykes L, Sethi M, Teoh TG, Robinson S. Vitamin D deficiency and supplementation during pregnancy. *Clin Endocrinol (Oxf)*. 2009;70(5):685-90.
- 24)

Keywords

Neonatal: from birth to the first 28 days of life

PROMPT doc no: 130911 Version: 6.0		
First created: 10/07/2015	Page 3 of 4	Last reviewed: 05/10/2023
Version changed: 05/10/2023	UNCONTROLLED WHEN DOWNLOADED	Next review: 05/10/2026



Clinical Practice Guideline Vitamin D Deficiency during Pregnancy

Peninsula Care Goal Safe

Maternal: of or relating to the mother, especially during pregnancy and within 6 weeks of delivery

Document management	Position
Executive Sponsor:	Executive Director Medical Services
Document Owner:	Clinical Director Women's Health
Document Author	Clinical Director Women's Health
Approved by:	Operations Director Women's Health
Date created/revised in archived system:	03/2013, 03/2018, 10/2023