PREVENTING VITAMIN D DEFICIENCY IN TODDLERS

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LEARNING POINTS

1. **Vitamin D deficiency is avoidable**
2. **Advice on vitamin D supplementation from healthcare professionals is key to the prevention of vitamin D deficiency**
3. **Infants and toddlers are at greater risk of vitamin D deficiency if their mother was vitamin D deficient during pregnancy, through low exposure to sunlight or not taking vitamin D supplements**
4. **Vitamin D is essential for healthy bone growth through regulating the absorption of calcium and phosphorus from the diet – minerals that contribute to the structure and strength of bones during child development**
5. **Very low levels of vitamin D in infants and toddlers can lead to:**
   - **Rickets - *deformed bones and short stature***
   - **Fits - *caused by low levels of calcium in the blood (hypocalcaemic seizures)***
6. **Vitamin D deficiency is also associated with some infectious, allergic and autoimmune diseases such as diabetes and asthma**
7. **Vitamin D is synthesised in the skin (cutaneous synthesis) under the influence of sunlight, in the summer months in the UK (April to September). Less vitamin D synthesis occurs in the north of the UK than in the south**
8. **Sunscreen blocks the cutaneous synthesis of vitamin D**
9. **Food sources of vitamin D are few and oily fish is the only significant source**
10. **Because cutaneous synthesis and diet alone do not always protect from vitamin D deficiency, the Department of Health and NICE recommend that pregnant women, breastfeeding mothers, infants and toddlers take a daily supplement of vitamin D**
11. **Children with pigmented skins, especially those of Asian, African and Middle Eastern origin, are at greater risk of vitamin D deficiency than white children**

PREVENTING VITAMIN D DEFICIENCY IN TODDLERS

Vitamin D deficiency in toddlers and infants is preventable but in the absence of appropriate advice from health professionals it is re-emerging in the UK, particularly in young children with pigmented skins in inner city areas.

Vitamin D deficiency decreased after the Second World War when cod liver oil (rich in vitamin D) was given free to all mothers and young children. However in the last few decades, low cost vitamin D supplements have not been available to recommend to those families not in receipt of benefits. During this time rickets and cases of hypocalcaemic seizures in infants and toddlers, caused by vitamin D deficiency, have increased[1].

Most pregnant women are unaware that they should take a vitamin D supplement for their health and that of their baby. The main cause of vitamin D deficiency in infants and toddlers is mothers not taking vitamin D supplements during pregnancy[2,3].

WHAT IS VITAMIN D?

Vitamin D is sometimes called the 'sunshine vitamin'. It is found in a few foods, but the main source is from synthesis in the skin by the action of sunlight (cutaneous synthesis). The ultraviolet rays of wave length 290-315nm convert 7-dehydrocholesterol in the skin to previtamin D_3.

The two main forms of vitamin D are:

- vitamin D_3 (cholecalciferol) produced by cutaneous synthesis and provided by a few foods and some vitamin supplements
- vitamin D_2 (ergocalciferol) provided by some supplements and found in very small amounts in some mushrooms.

Both forms of vitamin D are metabolized in the liver to 25-hydroxyvitamin D which is a stable metabolite, that is then converted in the kidneys to 1,25-di-hydroxyvitamin D, the active form of the vitamin.

Vitamin D is a fat-soluble vitamin and is stored in the body (in adipose tissue or fat deposits) when cutaneous synthesis and dietary intakes exceed daily requirements. Stores are used during the winter months when the critical wavelength in sunlight is insufficient for cutaneous synthesis.

Functions

Vitamin D controls the absorption of calcium and phosphorus in the intestine. These essential minerals, along with other nutrients, are components of the structure of bones and teeth. Calcium and phosphorus are therefore vital for the healthy growth of the skeleton during childhood.

Vitamin D also regulates the deposition and reabsorption of calcium, in and out of bony tissues, to maintain blood calcium levels within a normal range. It also plays a part in immune function, growth and defence against infections[4].

Blood serum or plasma are used to measure vitamin D levels. There is debate about the lower cut off for vitamin D sufficiency, which ranges between 50 and 125 nmol/l of 25-hydroxyvitamin D[4,5].

Unit conversion factors for concentrations of vitamin D in blood, food and supplements

Concentration in blood levels:
2.5nmol/l = 1ng/litre.

Amounts in food and supplements:
1µg vitamin D = 40 International Units (IU)
[µg = mcg = microgram]

VITAMIN D DEFICIENCY

In the UK low vitamin D status is currently defined as less than 25nmol/l of 25-hydoxyvitamin D in the serum or plasma. Below this concentration there is a risk of rickets in children and osteomalacia in adults[6]. Clinical manifestations of extremely low levels of vitamin D are:

- Rickets - soft, poorly formed and misshapen bones seen in growing children and osteomalacia in adults
- Fits (hypocalcaemic seizures) in infants due to low blood calcium levels as a result of vitamin D deficiency.

There are also associations between low vitamin D levels and higher rates of certain diseases including type 1 and 2 diabetes, allergy, upper respiratory tract infections and asthma, infectious diseases, multiple sclerosis, rheumatoid arthritis, cardiovascular disease, some cancers and dementia[7].

The risk of severe pre-eclampsia in pregnant women is higher in those with low levels of vitamin D[8,9], and evidence is emerging of a link between sudden infant death syndrome (SIDS) and low vitamin D levels.

An X-ray of the legs of a young child with rickets caused by vitamin D deficiency.

DIETARY REQUIREMENTS FOR VITAMIN D

Reference Nutrient Intakes (RNIs) (recommended dietary intakes) for vitamin D in the UK are set to guarantee sufficiency in age groups whose needs may not be met by sunlight alone – that is infants, toddlers, pregnant and breastfeeding mothers, and adults over 64 years of age. See Factsheet 1.1i

RNIs for vitamin D in the UK

Age group	Daily RNI[10]	
	Micrograms (µg)	International Units (IU)
0 - 6 months	8.5	340
7 months - 3 years	7	280
4 - 64 years	no RNI set	
Pregnant women	10	400
Breastfeeding women	10	400
65+	10	400

Dietary sufficiency is considered vital for:

- infants and toddlers to support their rapid rates of bone growth
- pregnant women to ensure adequate levels of vitamin D for the fetus to grow and develop and to lay down stores of vitamin D for the first few months of life
- breastfeeding mothers to support the bone remineralisation that occurs after breastfeeding ceases.

National Diet and Nutrition Surveys show that few toddlers and women of child bearing age in the UK meet their RNI through food alone, and will only attain their RNI when taking adequate vitamin D supplements[11,12].

There is currently no RNI for children over three years of age as it is expected that cutaneous synthesis of vitamin D will suffice. This is a subject of debate as low blood levels of vitamin D are found in significant numbers of children and adolescents in the UK[12-14]. Other countries set dietary recommendations of vitamin D for older children and adults e.g. between 5 and 10µg/day for children in most European countries and 15µg vitamin D for all children in the USA.

SOURCES OF VITAMIN D

The principal source of vitamin D is cutaneous synthesis - which occurs when the skin is exposed to sunlight. Few foods contain vitamin D.

1. Sunlight

The ideal time to spend outside each day to ensure adequate vitamin D levels is not easy to define as cutaneous synthesis depends on:

- **Season** – The critical wavelength in sunlight for cutaneous vitamin D synthesis reaches the UK only between April and September; it is absorbed by the atmosphere during winter months
- **Latitude** – In the south of the UK there is more sunlight of the critical wavelength
- **Weather** – Less vitamin D is synthesised on cloudy days than on bright sunny days
- **Air Pollution** – It reduces the critical UV light waves available for skin synthesis
- **Time Spent Outside** – Light with this wavelength cannot pass through glass so children must be outside for cutaneous vitamin D synthesis to occur
- **Time of Day** – More vitamin D is synthesised when sunlight is most intense in the middle of the day compared to early morning and late afternoon
- **Colour of Skin** – Darker skins require more time in the sun to synthesise the same amount of vitamin D as light skins[15]. Toddlers of African, African-Caribbean and South Asian origin are more likely to have lower vitamin D levels than Caucasian children[1,16]
- **Lifestyle** – Vitamin D synthesis is greatly diminished when most skin is covered by clothes, as can be the fashion, or is the case in girls and women with certain religious and cultural traditions
- **Sunscreen Use** – It blocks cutaneous synthesis of vitamin D.

Vitamin D excess as a result of excessive sunshine exposure does not occur[4].

2. Foods

Very few foods naturally contain vitamin D. Oily fish is the only significant source. Eggs and meat provide very small amounts. Breast milk provides extremely small amounts; the amount depending on the mother's own vitamin D levels.

3. Fortified foods

Foods in the UK that are fortified with vitamin D include:

- margarine – fortification has been a legal requirement since the Second World War
- formula milks – infant formulas, follow-on formulas and growing up milks
- evaporated milk
- a few breakfast cereals
- some brands of yogurts.

Vitamin D content in UK foods[17,18]

Food – Portion sizes for toddlers*	Vitamin D	
	Micrograms (µg)	International Units (IU)
2-3 Tbsp Sardines canned in tomato sauce (45g)	3.6	144
2-3 Tbsp Grilled salmon (45g)	3.2	128
2-3 Tbsp Sardines canned in vegetable oil (45g)	2.25	90
2-3 Tbsp Canned tuna in oil (45g)	1.35	54
1 Egg (60g)	1.1	44
2-3 Small thin slices liver (20g)	0.22	9
½ -1 Slice cooked lamb	0.18	7
1-2 Small slices chicken (30g)	0.06	9

Fortified foods	Vitamin D	
	Micrograms (µg)	International Units (IU)
100 -120mls Formula milk for over one year	1.9	76
100 -120mls Follow-on formula	1.4	56
100 -120mls Infant formula	1.2	48
30mls Evaporated milk	1.2	48
3-6 Heaped tbsp fortified breakfast cereal (18g)	0.7	28
1 Tsp margarine (5g)	0.4	16

** Household spoons vary in size: tablespoons (Tbsp) are about 15ml and teaspoons (Tsp) are about 5ml.*

In some countries e.g. Finland, Canada and the USA a wider range of foods are fortified with vitamin D, such as fresh cow's milk, other dairy products and some fruit juices.

Oily fish (salmon). Portion appropriate for 1-3 year olds.
See Factsheet 1.3

4. Supplements of vitamin D

In the UK a balanced diet and sunlight will not necessarily provide vulnerable populations with sufficient amounts of vitamin D to prevent deficiency. For this reason vitamin D supplements for all children under five and pregnant and breastfeeding women are recommended.

Recommendations on vitamin D supplementation for mothers and children in the UK[19-21]

	Recommended daily supplement	
	Micrograms (µg)	International Units (IU)
Pregnant and breastfeeding women	10	400
Breastfed infants from six months or from one month if the mother's nutritional status in pregnancy is in doubt	7.5	300
Formula-fed infants who are drinking less than 500mls formula milk/day	7.5	300
Children one to four years	7.5	300
Breastfed preterm infants	A vitamin supplement that includes vitamin D is usually prescribed	

Most vitamin supplements for infants, children and pregnant and breastfeeding women sold in the UK include vitamin D along with other vitamins, but the vitamin D content varies. Supplements containing vitamin D alone are available over the counter in some shops and chemists.

Healthy Start vitamins support the Department of Health (DH) recommendation of a daily supplement of vitamins A and D for infants and children aged one to four years. The daily dose of five drops contains:

- 233µg of vitamin A
- 20mg of vitamin C
- 7.5µg of vitamin D_3.

The Healthy Start supplements are the cheapest supplement but they are available only in some NHS clinics. NHS Trusts and Health Boards are required to provide them free of charge to the beneficiaries of the Healthy Start scheme and sell them at a fixed price to other clients. Not all NHS Trusts and Health Boards do this.

The European tolerable upper intake level of vitamin D for infants and children up to ten years is 25µg (1000IU)/day of vitamin D[22]. The Institute of Medicine in the USA considers it to be 50µg (2000IU)/day for infants and 100µg (4000IU)/day for toddlers and older children[4]. Excess vitamin D taken as supplements could have detrimental effects on health. Therefore parents must be advised to give their toddlers only one supplement containing vitamin D, at the recommended dose once per day.

HOW DO CRITICALLY LOW LEVELS OF VITAMIN D OCCUR IN INFANTS AND TODDLERS?

Low vitamin D levels in women of child bearing age may be a risk factor accounting for the rising incidence of vitamin D deficiency in infants and toddlers. A national survey of adults showed that 25 per cent of women of child bearing age have low vitamin D levels[23]. This is greater in women with dark pigmented skins; a survey from Wales has reported that about 50 per cent of pregnant women with pigmented skins have low vitamin D levels[24].

Infants whose mothers started pregnancy with low vitamin D levels and who did not take the recommended vitamin D supplement during pregnancy, are likely to be born with low levels of vitamin D and deficient stores[2,25].

Exclusively breastfed infants rely on their stores of vitamin D acquired in the womb and on any cutaneous synthesis after birth, because the vitamin D content of breastmilk is low. It is lower still in the milks of mothers who are vitamin D deficient[26].

Infant formula is fortified with vitamin D (see 'Vitamin D content in UK foods' table on page 4) but this concentration appears to be inadequate for infants born with low levels of vitamin D and deficient stores[3,27].

When body stores are low and cutaneous synthesis and dietary sources of vitamin D are limited, vitamin D deficiency is likely to develop in those children with high requirements, such as rapidly growing infants and toddlers.

ADVICE ON THE USE OF SUNSCREEN

Concern over the balance between having sufficient sun exposure to produce vitamin D, and over-exposure leading to burning of the skin and an increased risk of skin cancer, has led to confusion of public health messages. To provide balanced, evidence-based advice, a consensus statement on vitamin D has been produced by several organisations concerned with these questions[28].

Consensus Vitamin D Position Statement
This represents the unified views of the British Association of Dermatologists, Cancer Research UK, Diabetes UK, the Multiple Sclerosis Society, the National Heart Forum, the National Osteoporosis Society and the Primary Care Dermatology Society.

Vitamin D is essential for good bone health and for most people sunlight is the most important source of vitamin D. The time required to make sufficient vitamin D varies according to a number of environmental, physical and personal factors, but is typically short and less than the amount of time needed for skin to redden and burn. Enjoying the sun safely, while taking care not to burn, can help to provide the benefits of vitamin D without unduly raising the risk of skin cancer. Vitamin D supplements and specific foods can help to maintain sufficient levels of vitamin D, particularly in people at risk of deficiency. However, there is still a lot of uncertainty around what levels qualify as "optimal" or "sufficient", how much sunlight different people need to achieve a given level of vitamin D, whether vitamin D protects against chronic diseases such as cancer, heart disease and diabetes, and the benefits and risks of widespread supplementation.

ROLE FOR HEALTH PROFESSIONALS IN PREVENTING VITAMIN D DEFICIENCY

Timely advice by health professionals to families is critical to preventing vitamin D deficiency and its health consequences.

ADVICE ON VITAMIN D SUPPLEMENTS FOR MOTHERS, INFANTS AND TODDLERS

Mothers and Toddlers

Health professionals should recommend a daily supplement containing:

- 10µg (400IU) vitamin D for all pregnant and breastfeeding women
- 7.5µg (300IU) vitamin D for all toddlers.

Advice for Infants varies:

- Some NHS Trusts and Health Boards advise that all infants should begin a daily supplement of 7.5µg (300IU) vitamin D from birth or within a few weeks. This is safe advice for all infants[22].
- Other NHS Trusts advise the Department of Health Policy; if the mother has taken vitamin D supplements during pregnancy then her infant may delay taking a supplement until:
  - six months of age if breastfed
  - formula milk consumption has dropped to less than 500ml/day which will be around 11-12 months.

  Few infants will be seen regularly around these ages, so advice on vitamin D supplementation always needs to be given early and opportunistically.

TARGETING ADVICE TO VULNERABLE GROUPS

All families should receive advice about vitamin D, but the populations most at risk of deficiency are:

- Families with darker skins, of African, African-Caribbean and South Asian origin
- Infants and toddlers whose mothers:
  - cover up for religious or cultural reasons thereby limiting cutaneous vitamin D synthesis
  - did not take vitamin D supplements during pregnancy and/or while breastfeeding
  - lead mainly indoor lifestyles
- Families living in the northern parts of the UK
- Toddlers who do not have the opportunity to play outside regularly without sunscreen.

ADVICE ON OUTDOOR PLAY AND SUNSCREEN USE

Concern about too much sun exposure has resulted in many families with young children using very high factor sun creams throughout the summer months to protect the skin.

It is preferable for parents and carers to get to know how much sun exposure their children's skin can take without sunscreen before signs of redness appear. For very fair skins this may be a short time in the middle of the day and longer in the morning and late afternoon. Children with pigmented skins are much less likely to burn and these toddlers may not need sunscreen at all in the UK climate.

Children with darker pigmented skins are more likely to have lower levels of vitamin D and will benefit from more time outside in the sunlight without sunscreen to make sure they are synthesizing adequate amounts of vitamin D.

DIETARY ADVICE

Including oily fish in meals once or twice each week will increase dietary intake of vitamin D. Oily fish include sardines, pilchards, mackerel, herrings, salmon, trout and fresh tuna. Department of Health advice is to limit oily fish intake to four times per week for boys and twice per week for girls. This is because some oily fish may contain small amounts of toxins that girls can retain into their childbearing years.

DISTRIBUTION OF THE HEALTHY START VITAMIN SUPPLEMENTS

In most NHS Trusts and Health Boards the supplements are only available from NHS clinics. However in some areas the supplements are more widely available following campaigns to increase uptake and an investment in staff training.

- In Birmingham there is now universal supplementation so that all pregnant women, women with a child under one and all children aged under four are eligible for free Healthy Start vitamins regardless of their income, providing they are registered with a Birmingham GP. The funding to provide supplements to the families who are not eligible for the Healthy Start scheme comes from the public health budget. They are distributed via the Family Nurse Partnership nurses and are also available from the child health clinics, Children's centres, some local pharmacies and some GP surgeries
- In Devon all 43 Children's centres are the distribution points for the vitamin supplements but they are only provided to the Healthy Start beneficiaries.

Contact details for the person responsible for the Healthy Start vitamin supplements in my NHS Trust or Health Board are:

Distribution points for the Healthy Start vitamin supplements within my NHS Trust, Health Board or Local Authority are:

References

1. Ahmed SF, Franey C, McDevitt H, Somerville L, Butler S, Galloway P, Reynolds L, Shakih MG, Wallace AM. Recent trends and clinical features of childhood vitamin D deficiency presenting to a children's hospital in Glasgow. *Arch Dis Child.* 2011;96:694-96
2. Thomas SDC, Fudge AN, Whiting M, *et al.* The correlation between third-trimester maternal and newborn-serum 25-hydroxy-vitamin D in a selected South Australian group of newborn samples. *BMJ Open.* 2011;2:e000236. doi:10.1136/bmjopen-2011-00023
3. Shaw NJ, Pal BR. Vitamin D deficiency in UK Asian families: activating a new concern. *Arch Dis Child.* 2002;86:147-49
4. Holick MF. The d-lightful vitamin D for child health. *J Parenter Enteral Nutr.* 2012;36(1 Suppl):9S-19S
5. Cashman KD. Vitamin D in childhood and adolescence. *Postgrad Med J.* 2007;83:230-354
6. Lanham- New SA, Butriss JL, Miles LM *et al.* Proceedings of the Rank Forum on Vitamin D. *Br J Nutr.* 2011;105:144-56
7. Holick MF, Garabedian M. Vitamin D: photobiology, metabolism, mechanism of action, and clinical applications. In: Favus MJ, ed. Primer on the metabolic bone diseases and disorders of mineral metabolism. 6th ed. Washington, DC: American Society for Bone and Mineral Research. 2006:129-37
8. Dror DK. Vitamin D status during pregnancy: maternal, fetal, and postnatal outcomes. *Curr Opin Obstet Gynecol.* 2011;23:422-26
9. Bodnar LM, Catov JM, Hyagriv NS, *et al.* Maternal vitamin D deficiency increases the risk of preeclampsia. *J Clin Endocrinol Metab.* 2007;92:3517e22
10. Department of Health, 1991. Dietary Reference Values for Food Energy and Nutrients for the United Kingdom. Report of the Panel on Dietary Reference Values of the Committee on Medical Aspects of food Policy. Report on Health and Social Subjects. HSMO, London
11. Department of Health, 2011. National Diet and Nutrition Survey: Headline results from Years 1 and 2 (combined) of the rolling programme 2008/9 - 2009/10. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_128166
12. Gregory JR, Collins DL, Davies PSW, Hughes JM, Clarke PC. National Diet and Nutrition Survey: children aged 1.5 - 4.5 years. Volume I: report of the diet and nutrition survey. London: HMSO, 1995
13. Department of Health, 2011. National Diet and Nutrition Survey: headline results from years 1 and 2 (combined) of the rolling programme, 2008/09 - 2009/10; Supplementary report: Blood Analytes http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_130728
14. Gregory J, Lowe S, Bates CJ, Prentice A, Jackson LV, Smithers G, Wenlock R, Farron M. National Diet and Nutrition Survey: Young People Aged 4–18 years. Volume 1: Report of the Diet and Nutrition Survey. London: The Stationery Office, 2000
15. Clemens TL, Henderson SL, Adams JS, Holick MF. Increased skin pigment reduces the capacity of the skin to synthesise vitamin D_3. *Lancet.* 1982;1:74-76
16. Lawson M, Thomas M. Vitamin D concentrations in Asian children aged 2 years living in England: population survey. *BMJ.* 1999;318:28
17. Food Standards Agency. McCance & Widdowson's The composition of foods, Sixth summary edition. Cambridge: The Royal Society of Chemistry, 2002
18. The Infant Formula and Follow-on Formula (England) Regulations, 2007 UK SI No 3521 www.legislation.gov.uk/uksi/2007/3521/contents/made
19. Department of Health, 2012. Letter from Chief Medical Officer to Healthcare Professionals: Vitamin D: Advice for at risk groups, dated: 02.02.12
20. Department of Health, 2002. Scientific review of the welfare food scheme London: Stationery Office
21. National Institute for Health and Clinical Excellence. Public Health Guidance 11: Improving the nutrition of pregnant and breastfeeding mothers and children in low-income households, 2011
22. Scientific Committee on Food. Opinion of the Scientific Committee on Food on the Tolerable Upper Intake Level of vitamin D. Brussels: European Commission, 2002
23. Henderson L, Irving K, Gregory J. The National Diet and Nutrition Survey: Adults Aged 19–64 years. Volume 3: Vitamin and Mineral intake and urinary analytes. London: The Stationery Office, 2002
24. Datta S, Alfaham M, Davies DP, Dunstan F, Woodhead S, Evans J, Richards B. Vitamin D deficiency in pregnant women from a non-European ethnic minority population--an interventional study. *BJOG.* 2002;109:905-08
25. Mughal MZ, Salama H, Greenaway T, Laing I, Mawer EB. Lesson of the week: Florid rickets associated with prolonged breastfeeding without vitamin D supplementation. *BMJ.* 1999;318:39-40
26. Hollis BW, Wagner CL. Vitamin D requirements during lactation: high-dose maternal supplementation as therapy to prevent hypovitaminosis D for both the mother and the nursing infant. *Am J Clin Nutr.* 2004;80:Suppl 6:1752S-58S
27. Callaghan AL, Moy RJ, Booth IW, Debelle GD, Shaw NJ. Incidence of symptomatic vitamin D deficiency. *Arch Dis Child.* 2006;91:606-07
28. Cancer Research UK. Consensus Vitamin D Position Statement, 2010 http://info.cancerresearchuk.org/prod_consump/groups/cr_common/@nre/@sun/documents/generalcontent/cr_052628.pdf

Resources

Department of Health, 2009. Vitamin D - an essential nutrient for all...but who is at risk of vitamin D deficiency? Important information for Healthcare Professionals. The Stationery Office, London (http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_127421.pdf)

Healthy Start scheme website (http://www.healthystart.nhs.uk)

PREVENTING VITAMIN D DEFICIENCY IN TODDLERS
GUIDANCE & TIPS FOR PARENTS

Foods

- Vitamin D is found in only a few foods: oily fish is the best source and eggs and meat contain small amounts
- Some foods are fortified with vitamin D – formula milks, margarine and some yogurts and breakfast cereals.

Sunlight

- Most of your toddler's vitamin D is made in his / her skin when outside in the sunlight in the summer months (April-September)
- Sunscreen will stop your toddler making vitamin D in his / her skin so allow your toddler to play outside without sunscreen at times when he / she is unlikely to burn
- The amount of time toddlers can spend outside in the sunshine without burning will vary depending on their skin colour.

Vitamin D Deficiency

- Babies, toddlers and mothers with dark skins living in the UK are the most likely to become deficient in vitamin D if they do not take a daily supplement of vitamin D
- Mothers who cover most of their skin when outside are most at risk of vitamin D deficiency
- Babies and toddlers with very low amounts of vitamin D could have fits or get rickets – a disease when bones become soft and misshapen
- Low vitamin D levels may make toddlers more likely to get diabetes and diseases later in life such as heart disease, multiple sclerosis and arthritis.

Supplements of Vitamin D

- Your toddler is not guaranteed to get enough vitamin D from foods and sunshine alone, so give him / her a vitamin supplement containing vitamins A and D every day
- The Healthy Start children's vitamin drops contain vitamins A, C and D
- Pregnant and breastfeeding mothers should take a daily supplement of 10µg (400IU) vitamin D every day. This is to make sure your baby grows and develops in your womb and is born with sufficient stores of vitamin D to make use of in the first few months of life.

Healthy Start Vitamin Coupons

- If you are receiving Healthy Start vouchers then you will also get green Healthy Start vitamin coupons every eight weeks to exchange for free Healthy Start vitamin drops for for your infant or toddler. Ask your health visitor where to get them
- Pregnant and breastfeeding women signed up for Healthy Start also get green coupons to exchange for free Healthy Start tablets with vitamin D.

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Supported by an educational grant from Danone UK

ITF196 - April 2012