

## VITAMINS (Multiple)

### Use:

Children with malabsorption often develop sub-clinical fat soluble vitamin deficiency, and benefit from being given a regular multivitamin supplement. So too do babies on sustained intravenous nutrition.

### Nutritional factors:

The UK "Welfare Food" scheme, as originally introduced in 1940, included liquid milk, national dried milk, concentrated orange juice and cod liver oil, and few disputed Winston Churchill's claim that there could be "no finer investment for any country than putting milk into babies." Mothers also received special supplements. Because the scheme was generally credited with actually improving the health of children during the war years, the relevant regulations were never repealed, although infant vitamin drops (and maternal tablets) replaced cod liver oil and orange juice in 1975, and commercial formula milks replaced National Dried Milk in 1977. Uptake has, however, declined in recent years. By 2000, less than 5% of babies were getting a vitamin supplement in the first 6 months of life, and only 10% of babies 8–9 month old.

The scheme has now been revived, and pregnant women and children under four in the UK in families on income support, income-based job-seekers allowance, or child tax credit and an income below £14,155 a year, are now entitled to vouchers that can be obtained from midwives and health visitors and exchanged for fresh fruit, vegetables and milk worth £2.80 a week. For details see: [www.healthystart.nhs.uk](http://www.healthystart.nhs.uk) Children 6 months to 4 years old in these families are also entitled to free "Healthy Start" vitamin A and D drops, while pregnant women are entitled to free vitamin D tablets (as outlined in the vitamin D monograph).

Unfortunately the "Healthy Start" programme has not addressed the needs of babies in the first six months of life. Artificially fed babies seldom have problems because all formula milks are all fortified, but this does not cover the need of a preterm baby on a total intake of less than 500 ml a day. In addition many breast fed babies suffer sub-clinical vitamin D deficiency because their mothers are, themselves, unknowingly deficient, and numerous papers have been published from all parts of the world over the last ten years reporting the reappearance of severe rickets, hypocalcaemic seizures and even death from cardiomyopathy. A new drive is long overdue to give *all* breastfed babies extra vitamin D (plus vitamin K to those not given it IM at birth).

### Oral vitamins:

**"Healthy Start" children's vitamin drops:** The UK Government reintroduced its own branded product in December 2006. A 5 drop dose provides 233 micrograms of vitamin A, and 7.5 micrograms of vitamin D.

**Abidec<sup>®</sup> drops:** The usual dose is 0.3 ml once a day by mouth throughout the first year of life. Very preterm babies, and children with cystic fibrosis and other forms of malabsorption, are often given 0.6 ml once a day, a dose that provides 400 micrograms (1333 units) of vitamin A, 10 micrograms (400 units) of vitamin D, 40 mg of vitamin C, and some vitamin B<sub>1</sub>, B<sub>2</sub>, B<sub>6</sub>, and nicotinamide (but no vitamin E, or vitamin K).

**Dalivit<sup>®</sup> drops:** Normally given in the same way, and in the same dose, as Abidec. The vitamin content is almost the same as for Abidec, but a 0.6 ml dose contains an excess (1.5 mg [5,000 units]) of vitamin A.

### Intravenous vitamins:

**Water soluble vitamins:** Aminoacid solutions used to provide parenteral nutrition (q.v.) will have usually had all the more important vitamins added (as Solivito N<sup>®</sup>) prior to issue by the pharmacy.

**Fat soluble vitamins:** The manufacturers say that babies weighing under 2.5 kg should have 4 ml/kg of Vitlipid N<sup>®</sup> *infant* added to their Intralipid<sup>®</sup> (q.v.) each day so that they get the vitamin D<sub>2</sub> and K<sub>1</sub>, they need, but this strategy reduces calorie intake (since Vitlipid is formulated in 10% Intralipid) – a quarter of this dose normally suffices. A dose of 10 ml/day is recommended for all children weighing more than 2.5 kg, but such supplements are only important when sustained IV feeding becomes necessary.

### Supply:

**Oral preparations:** 10 ml bottles of the UK Governments "Healthy Start" children's drops (which should last 2 months) can be prescribed, and can also be sold for £1.70. They are available free to families on income support or income-based jobseeker's allowance. 25 ml bottles of Abidec cost £1.80, and 25 ml bottles of Dalivit cost £1.60. Both contain sugar. These preparations do not require a doctor's prescription.

**IV preparations:** 10 ml ampoules of Vitlipid N *infant*, designed for adding to Intralipid, contain 690 micrograms (2,300 units) of vitamin A, 10 micrograms (400 units) of vitamin D, 7 mg of vitamin E, and 200 micrograms of vitamin K. They cost £1.70. Any aminoacid solution designed for IV use will have normally had a vial of Solivito N (containing small amounts of vitamins B<sub>1</sub>, B<sub>2</sub>, B<sub>6</sub>, B<sub>12</sub>, nicotinamide, sodium pantothenate, vitamin C and folic acid) added prior to issue. Such vials also cost £1.70 each. Supplements of Solivito N can, alternatively, be added to Intralipid, or to a plain infusion of IV dextrose.

### References:

- Department of Health. Report on Health and Social Services No 32. *Present day practice in infant feeding: third report*. London, 1988.
- Ferenchak AP, Sontag MK, Wagener JS, *et al*. Prospective long-term study of fat-soluble vitamin status in children with cystic fibrosis identified by newborn screen. *J Pediatr* 1999;**135**:601–10.
- Department of Health. Report on Health and Social Services No 51. *Scientific review of the welfare food scheme*. London: The Stationary Office, 2002.
- Leaf A. Vitamins for babies and young children. *Arch Dis Child* 2007;**92**:160–4.