10 Farr PM, Marks JM, Diffey BL, Ince P. Skin fragility and blistering due to use of sunbeds. *Br Med J* 1988;**296**:1708-9.
11 Murphy GM, Wright J, Nicholls DSH, *et al*. Sunbed-induced pseudoporphyria. *Br J Dermatol* 1989;**120**:555-62.
12 Jones SK, Moseley H, MacKie RM. UVA-induced melanocytic lesions. *Br J Dermatol* 1987;**117**: 111-5.
13 Williams HC, Salisbury J, Brett J, du Vivier A. Sunbed lentigines. *Br Med J* 1988;**296**:1097.
14 Kligman LH, Kaidbey KH, Hitchens VM, Miller SA. Long wavelength (>340 nm) ultraviolet-A induced skin damage in hairless mice is dose dependent. In: Passchier W, Bosnjakovic BFM, eds. *Human exposure to ultraviolet radiation: risks and regulations*. Amsterdam: Elsevier, 1987:77-81.
15 Bissett DL, Hannon DP, Orr TV. Wavelength dependence of histological, physical and visible changes in chronically UV-irradiated hairless mouse skin. *Photochem Photobiol* 1989;**50**:763-9.
16 Sterenborg HJCM, van der Leun JC. Tumorigenesis by a long wavelength UV-A source. *Photochem Photobiol* 1990;**51**:325-30.
17 Van Weelden H, de Gruijl FR, van der Putte SCJ, *et al*. The carcinogenic risks of modern tanning equipment: is UV-A safer than UV-B? *Arch Dermatol Res* 1988;**280**:300-7.
18 Diffey BL. Analysis of the risk of skin cancer from sunlight and solaria in subjects living in northern Europe. *Photodermatology* 1987;**4**:118-26.
19 Slaper H, van der Leun JC. Human exposure to ultraviolet radiation: quantitative modelling of skin cancer incidence. In: Passchier W, Bosnjakovic BFM, eds. *Human exposure to ultraviolet radiation: risks and regulations*. Amsterdam: Elsevier, 1987:155-71.
20 Swerdlow AJ, English JSC, MacKie RM, *et al*. Fluorescent lights, ultraviolet lamps, and risk of cutaneous melanoma. *Br Med J* 1988;**297**:647-50.
21 Walter SD, Marrett LD, From L, Hertzman C, Shannon HS, Roy P. The association of cutaneous malignant melanoma with the use of sunbeds and sunlamp. *Am J Epidemiol* 1990;**131**: 232-43.

Milk for babies and children

No ordinary cows' milk before 1 year

What milk should a child drink? For the suckling infant the answer is clear—breast milk; or failing that an infant formula. Recently, however, our nutritional priorities have moved on from suckling babies to weanlings and toddlers. New products have arrived—the follow on milks. Another factor is that health conscious families are buying skimmed and semi-skimmed milk. So what advice should be given to mothers, living in developed countries, who want to know which milk is best for their children?

The table gives the composition of the milks from which the choice has to be made. Most infant formulas and follow on milks are reconstituted from powders, but some are now available as liquids. All infant formulas and follow on milks available in Britain are fortified with iron and vitamins A and D.

From birth to 6 months

Up to 6 months the child should receive breast milk or an infant formula. Few will require solid weaning foods before 3 months, but almost all will want something extra by 6 months. When compared with bottle fed babies those who have been breast fed for 13 weeks or more have fewer gastrointestinal upsets and fewer admissions to hospital.[1] If an infant formula is chosen one of the whey based products is preferable, though casein predominant formulas are acceptable. Mothers, health visitors, and doctors commonly switch babies from one type of milk to the other; such switching is unnecessary but is probably harmless.

Vitamin supplements are not formally recommended by the Department of Health for children under 6 months. Ideally mothers should have received vitamin D supplements in pregnancy but few do. If there is any doubt about the mother's vitamin D state during pregnancy—as, for example, in Asian mothers, winter pregnancies, and women living in northern Britain—then a breast fed baby should be given a vitamin D supplement.

Between 6 and 12 months

Between 6 and 12 months breast feeding may continue. Bottle fed babies should continue with their infant formula or they can have a follow on milk (see table); there is little to choose between them. Theoretically, the lower protein: energy ratios in infant formulas would not adequately support a mixed diet that was very low in protein—one made up of fruit and sweets, for example. In practice and in careful studies this does not seem to be a problem, but if there is any doubt then use a follow on formula. I advise mothers who are bottle feeding to continue with an infant formula. Some mothers, however, wish to move on from an infant formula, seeing this as a welcome sign of development of their babies; for them a follow on milk should be recommended rather than cows' milk.

All babies between 6 and 12 months given breast milk will need vitamin supplements. The recommended dose of supplementary vitamin D is 7 μg daily. This is provided by one Department of Health vitamin supplement five drops daily (not prescribable on FP10) and by many proprietary preparations. Vitamin policies have changed several times over the years and there are many different views.[2-4] Those babies given infant formulas or follow on milks will not need vitamin supplementation. Special efforts should be made to ensure that children having only limited exposure to the sun—those in northern urban areas, those not having a sunny holiday, Asian children, those taking vegetarian diets, and others with cultural, social, or medical reasons limiting exposure—should receive vitamin D supplements or drink a milk containing vitamin D.

I do not recommend ordinary cows' milk before the age of 1 year. It contains little vitamin D and iron and causes subclinical but appreciable gastrointestinal bleeding in about a third of children.[5] Other possible disadvantages are its higher concentrations of saturated fat and sodium, but the importance of this for the child's future is not clear. The extra cost of using an infant formula or a follow on milk rather than ordinary cows' milk (10-15p a day) is small compared with the price of other baby products.

Between 12 and 24 months

After the age of 1 year the choice is between cows' milk or a follow on milk; both are acceptable as part of a mixed diet. Semiskimmed and skimmed milk are not recommended at this age because of their limited energy content. Follow on milks are not used nearly as much in Britain as in some other countries, but they may have some advantages: they contain

Content of available milk for babies and children per 100 g feed (made up with water according to manufacturer's instructions where necessary)

	Energy in kJ (kcal)	Protein (g)	Vitamin D (μg)	Iron (mg)	Saturated fat (g)	Sodium (mmol)	Cost (pence)	Earliest age for use
Breast milk	290 (70)	1·3	0·01	0·08	2·1	0·6		From birth
Infant formulas*	285-290 (67-70)	1·5-1·9	1·0	0·4-0·7	1·0-1·9	0·6-1·1	6-7	From birth
Follow on milks†	270-285 (65-67)	2·0-2·9	1·1-1·2	0·7-1·2	1·2	1·3-1·5	6-7	6 Months
Cows' milk:								
Ordinary	285 (67)	3·4	0·02	0·05	2·5	2·2	4·5-6	12 Months
Semiskimmed	200 (48)	3·4	0·02	0·05	1·1	2·2	4·5-6	2 Years
Skimmed	140 (34)	3·4	0·02	0·05		2·2	4·5-5	5 Years

*Infant formulas available in Britain: whey based—Aptamil, Ostermilk, Premium, SMA Gold; casein predominant—Milumil, Ostermilk 2, Plus, SMA White.
†Follow on milks available in Britain: Junior Milk, Progress.

added iron and vitamin D and have limited saturated fat and sodium contents, without any limitation of energy content. A follow on milk enables a mother to adopt a healthy eating policy for her family without any risk of compromising the energy intake of her growing toddler. Milk is only part of the diet, however, and many other foods that toddlers eat—particularly fast foods—could result in very high intakes of saturated fat and sodium. The follow on formulas in Britain all have reduced saturated fat content, but this will not be compulsory if the draft European Community directive becomes law; some European follow on formulas contain mostly cows' milk fat.

From 2 years onwards

For 2 years onwards children may drink cows' milk, follow on milk, or semiskimmed milk. Some families are enthusiasts for semiskimmed, but the child will need an adequate source of dietary energy from somewhere. There is little point in limiting the intake of saturated fat from milk if this is replaced by other saturated fats such as butter. The important concept is that by the age of 5 the child's diet (and that of his or her parents) should be such that fat provides no more than 35% of the total energy.[6]

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1 Howie PW, Forsyth JS, Ogston SA, Clark A, Florey CV. Protective effect of breast feeding against infection. *Br Med J* 1990;**300**:11-6.
2 Department of Health and Social Security. *Present day practice in infant feeding*. London: HMSO, 1974. (Report on health and social subjects 9.)
3 Department of Health and Social Security. *Present day practice in infant feeding: 1980*. London: HMSO, 1980. (Report on health and social subjects 20. Reprinted with minor revision 1983.)
4 Department of Health and Social Security. *Present day practice in infant feeding: 3rd report*. London: HMSO, 1988. (Report on health and social subjects 32.)
5 Ziegler EE, Fomon SJ, Nelson SE, *et al*. Cow milk feeding in infancy: further observations on blood loss from the gastrointestinal tract. *J Pediatr* 1990;**116**:11-8.
6 Department of Health and Social Security. *Diet and cardiovascular disease*. London: HMSO, 1983. (Report on health and social subjects 28.)

Diagnosing cancer of the pancreas

Laparotomy usually not necessary

Adenocarcinoma of the pancreas kills 6000 people in England and Wales each year.[1] The incidence has increased,[2] but the presenting symptoms (weight loss, jaundice, pain) and dismal overall prognosis (less than 1% survival at five years) remain little changed.[3,4] Nevertheless, over the past decade several specialist centres have considerably reduced the morbidity and mortality of surgical excision, with up to 18% actuarial survival at five years.[5-8] These results at least provide a rationale for early diagnosis.

New and improved imaging techniques have altered diagnostic algorithms,[8-10] increased preoperative diagnostic rates, and given improved information about tumour stage.[11-13] Not surprisingly, they have failed to improve resectability rates as they are generally performed only in patients with symptoms.[3,9,10,14] Ultrasonography is the first choice for pancreatic imaging, and in good hands may be equivalent to computed tomography.[15] Endoscopic or intraoperative ultrasonography with high frequency probes give optimal pancreatic imaging,[16,17] but their application is necessarily limited. Endoscopic retrograde cholangiopancreatography is particularly valuable for investigating jaundiced patients, in whom it may provide both a radiological and a pathological diagnosis.[3,18] Angiography and magnetic resonance imaging have little additional role in diagnosis.[12,19] Occasionally a cystic tumour may be mistaken for the much commoner inflammatory pancreatic collection, but these should be distinguishable by clinical and radiological features.[20,21]

A tissue diagnosis is strongly recommended in all cases but is particularly important in the absence of detectable metastatic disease. Without metastases no imaging technique can differentiate adenocarcinoma of the pancreas from other benign or malignant pancreatic masses.[8,12,22,23] Indeed, such differentiation may be extremely difficult during laparotomy even with the aid of histological and cytological examination, although rapid immunostaining of intraoperative biopsy specimens may be helpful.[24]

A cytological diagnosis may be made from exfoliated cells in the duodenal secretions or pancreatic juice,[23,25] from a fine needle aspirate of the pancreatic mass (taken percutaneously under ultrasonic, computed tomographic, or pancreatographic guidance or directly during operation),[26-29] or from pancreatic ductal brushings at endoscopic retrograde cholangiopancreatography.[18] Biopsy specimens for histological diagnosis may be obtained at endoscopic retrograde cholangiopancreatography from a duodenum invaded by tumour, by a radiologically guided biopsy needle,[30] or during surgery with or without intraoperative localisation by ultrasonography.[16] Complications are uncommon but aspiration with a fine needle (22 gauge) is safer than biopsy with a needle (18 gauge or larger).[30,31] False negative results occur with all techniques, and the method of choice often depends on local skills and the proposed method of treatment. Histological evidence of pancreatitis must be interpreted with caution as carcinomas may both arise in patients with chronic pancreatitis[32] and cause pancreatitis by ductal obstruction.[33] Without a tissue diagnosis of adenocarcinoma it is difficult to choose the optimal treatment and advise patients on their prognosis.[34] Such patients should be monitored with care, especially if they have been treated with a biliary stent, which is liable to gradual occlusion.

Several tumour associated antigens, including carcinoembryonic antigen, α fetoprotein, elastase, carbohydrate antigens 50 and 19-9 (Ca50, Ca19-9), DUPAN-2, and MUSE11, have been assessed in both the serum and pancreatic juice of patients with pancreatic cancer.[8,23,35-37] Ca19-9 has been most studied recently[38,39] and may help confirm the diagnosis of pancreatic carcinoma in select groups of patients who are frail or who have had negative findings on biopsy.[40] The serum concentrations of tumour associated antigens in patients with pancreatic carcinoma overlap considerably with those observed in benign disease,[41,42] particularly in patients with smaller tumours. Thus these antigens seem to have little role in excluding a diagnosis of carcinoma or in population screening.[41] Screening is made even more difficult by the lack of a readily identifiable group at high risk of developing pancreatic carcinoma.

Although the diagnosis of "early" pancreatic carcinoma remains uncommon, improvements in imaging and tissue sampling techniques mean that most patients presenting with symptoms of pancreatic carcinoma can be given a definitive diagnosis without recourse to laparotomy.

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1 Office of Population Censuses and Surveys. Deaths by cause: 1989 registrations. *OPCS Monitor* 1990 June 26:3.
2 Fontham ETH, Correa P. Epidemiology of pancreatic cancer. *Surg Clin North Am* 1989;**69**:551-67.
3 Gudjonsson B. Cancer of the pancreas: 50 years of surgery. *Cancer* 1987;**60**:2284-303.
4 Connolly MM, Dawson PJ, Michelassi F, Moossa AR, Lowenstein F. Survival in 1001 patients with carcinoma of the pancreas. *Ann Surg* 1987;**206**:366-73.