A study by Gosney (2003) aimed to identify the number of prescriptions and consumption of nutritional supplements (sip feeds) over a 24-hour period on an elderly care ward. This included the measurement and collection of anthropometric and biochemical data of patients who did and did not receive sip feeds in order to compare the indication for their use and calculate the cost of wasted feed.

**Methodology** This was an observational study carried out in four acute elderly care wards (with 24 beds on each ward). All patients were apparently eligible for the study, with no inclusion/exclusion criteria stated. The study was approved by an ethics committee and all patients gave written informed consent.

Baseline objective measurements included serum albumin within 48 hours of the study day, and Body Mass Index (BMI) using demispan to calculate height as this is an alternative measure in older people and can be performed while seated (McLaren and Green, 1998a).

Weight was measured using the same set of calibrated scales for each patient. Undernutrition was defined as a BMI equal to 20 and/or serum albumin equal to 35g/l.

Wastage of the sip feed was calculated by measuring the prescribed sip feed at the time of administration and just before disposal using calibrated scales. All sip feeds were given out on medicine administration rounds and were left for 3–4 hours before collection and reweighing. A patient questionnaire was used to subjectively assess the palatability and wastage of sip feeds.

**Results** Ninety-six patients were included in the study, and age was not reported. Patients had been on the wards for between one to nine days and had various acute medical conditions.

Twenty-four patients received sip feed orally (25 per cent). Eighty-two patients (85 per cent) could be weighed and had their BMI calculated, including all those on sip feeds. Of the 23 patients with a BMI of <20, seven (30 per cent) were on sip feeds and 16 (70 per cent) were receiving no supplements.

In 17 out of the 24 patients (70 per cent), sip feeds were prescribed even though the BMI was 20 or more. Also, compliance with sip feeds was less than expected, particularly in 16 out of the 23 patients (70 per cent) with a BMI of <20 who were not malnourished but who had a BMI of <20 and were more likely to be malnourished did not receive sip feeds, while the same proportion of patients who did receive sip feeds had a BMI of 20 or more. Also, compliance with sip feeds was low, which led to a 63 per cent wastage with large cost implications. The recommendations from this study were for prospective studies to be undertaken to assess: the timing of the prescription; and the flavour and quantities delivered and their effect on compliance.

The greatest feed wastage was seen in patients who disliked the taste.

Two patients received sip feeds as supplements to tube feeding following strokes, therefore compliance of the remaining 22 patients was 37 per cent. Over the 24-hour period the cost for one day’s sip feeds on the four wards was calculated to be £79.56, of which £50.12 (63 per cent) was wasted.

**Discussion of the study** The study’s main limitation is that serum albumin is a poor measure of nutritional status and may be altered as part of the body’s response to an acute illness. Although some anthropometric measures are better validated than BMI, BMI measures were readily available during the first 24 hours of an admission to an acute hospital bed.

The number of patients having sip feeds administered was less than expected, particularly in 16 out of the 23 patients (70 per cent) with a BMI of <20 who were not prescribed these supplements. Compliance with drinking the sip feeds was also low (37 per cent) which could have been due to lack of thirst, preference for frequently available cups of tea, presentation of the sip feeds, poor dexterity, and the flavour, texture and temperature of the feeds. Mean sip feed wastage was higher than in previously reported studies.

This was a small study and it was acknowledged that an extrapolated loss of more than £18,000 a year on food supplements cannot be fully validated. However, the study reiterates the extent of malnutrition in older hospitalised patients and the importance of giving sip feeds to patients who need them most. It was recommended that BMI should be used to guide the need for a prescription of sip feeds and that sip feeds could be decanted from cartons and administered in smaller volumes.

**Commentary** This study suggests that most patients who had a BMI of <20 and were more likely to be malnourished did not receive sip feeds, while the same proportion of patients who did receive sip feeds had a BMI of 20 or more. Also, compliance with sip feeds was low, which led to a 63 per cent wastage with large cost implications. The recommendations from this study were for prospective studies to be undertaken to assess: the timing of the prescription; and the flavour and quantities delivered and their effect on compliance. It was also recommended that greater care must be exercised to ensure patients that are prescribed supplements do actually drink them.
The advantages of this study are that it clarifies that sip feeds are prescribed inappropriately and that a large proportion of feeds administered are wasted in the 96-bed acute elderly care unit. However, there are also several weaknesses of the study which need to be addressed before further similar prospective studies or changes to general practice regarding sip-feed administration are considered.

First, the sample size was very small and there is no evidence of a power analysis to calculate the sample size needed to increase the chance of significant results (Polit and Hungler, 1999).

There was no inclusion/exclusion criteria stated but also, despite the claim that written informed consent had been gained, eight patients were unable to complete the questionnaire due to confusion, acute illness or refusal. According to Polit and Hungler (1999), patients should be capable of understanding the information given to them for informed consent to take place. Therefore these patients should either have been excluded from the study at the outset or, if their condition had changed, should have been withdrawn from the study and not just the questionnaire section.

It was also not clear why two patients receiving sip feeds as supplements to tube feeding following strokes were excluded from the numbers regarding compliance \((n=22)\) as all 24 patients were said to be receiving sip feeds orally.

The authors identified the limitations of the methods used to assess nutritional status. However, it should be emphasised that the limitations of measuring serum albumin are particularly relevant in this study. Serum albumin levels of acutely ill patients usually fall as a result of inflammatory disorders and other diseases or trauma (Klein et al, 1997). Measurement of BMI may also be less reliable in older people due to the physiological effects of ageing (McLaren and Green, 1998b).

The study does not mention patients’ normal diet that could have inversely affected supplementary intake, particularly in the patients with a BMI of 20 or more. It is unclear whether sip feeds were used as meal replacements and/or as supplements. Rollins, cited in Nursing Times (2003), highlighted that the study did not say whether simple foods/snacks were available on the wards between mealtimes.

An alternative method of nutritional assessment – a 24-hour recall of diet and fluids consumed by the patients on the previous day – could have been used to assess food intake and the information then analysed using nutrient analysis software to determine the nutritional content. The advantages of a 24-hour recall are: it is quick and easy to complete, it does not alter the patients’ usual diet and can provide detailed information on types of foods consumed.

The disadvantages are that: it relies on memory (which could be a problem for older people); one 24-hour recall is not generally representative of a person’s usual intake; there is a tendency for over or under-reporting; and the interviewer’s influence could introduce bias (Lee and Nieman, 1996). However, 24-hour recall still appears to be the quickest and most practical method of assessing dietary intake in this type of study.

The results of the patient questionnaire were reported in relation to the palatability of the feed but there were no comments on the practical aspects of the questionnaire, such as ‘Why have you not drunk it?’ Two out of the five responses were ‘Cannot reach it’ and ‘Difficulty with the straw/carton’. These results would have been useful to determine the reason why sip feeds were wasted. It would also have been useful if patient observation was included to clarify any practical problems experienced by the patients in relation to the handling and consumption of the sip feeds.

The authors concluded that wastage could be reduced if supplements were decanted from cartons and administered in smaller volumes. Potter et al (2001) investigated the routine use of sip feeds \((1.5\text{kcal/ml})\) in older patients where the intervention group received 120ml of the sip feed three times a day as a medicine.

Although it was demonstrated that routine prescription of sip feed given in this way can prevent weight loss and improve intake in non-obese older patients, the only group that appeared to show an improvement in functionality and mortality as well as weight gain was the undernourished group.

A review of this study questioned the cost-effectiveness of this practice and also highlighted the importance of routine nutritional screening on admission to hospital to detect those patients who are malnourished or at risk of malnutrition (Holder, 2002). This in theory may then reduce sip-feed wastage.

Rollins, cited in Nursing Times (2003), identified another potential weakness of this study – the cost of wastage may have been significantly overestimated as hospitals do not usually pay list price for sip feeds as calculated. Therefore, this factor would also need to be addressed in future work.

**Conclusion** Further prospective trials to examine the prescription and consumption of sip feeds are required. In the meantime, accurate nutritional screening should be performed to ensure patients who are malnourished or at risk of malnutrition are carefully selected for nutritional intervention, including the use of sip feeds.