ing (including fine bore tube feeding) have been well documented,⁵ but nasogastric feeding remains an essential part of nutritional support.

Percutaneous endoscopic gastrostomy is a major technical advance in obtaining access for nutritional support, and though its safety is well established, it is still an invasive procedure and not suitable for all. What has not been well established, and which neither Park and colleagues or Forgacs and colleagues addressed, is the indication for nutritional support in patients with disabling neurological conditions. Research and training in nutritional support are needed to define and outline the risks and benefits of nutritional intervention in such patients. Percutaneous endoscopic gastrostomy feeding is an advance for those who require long term tube feeding, and we would not have considered randomising patients who had already had four weeks of nasogastric tube feeding.

We do not see percutaneous endoscopic gastrostomy feeding as a panacea for all, nor will its use "prevent the degrading spectacle of elderly, undernourished patients with their hands bandaged to the side of the bed." Let clinicians decide whether nutritional support is appropriate and then institute appropriate treatment using well proved technological advances such as percutaneous endoscopic gastrostomy.

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- 1 Park RHR, Allison MC, Lang J, Spence E, Morris AJ, Danesh BJZ, *et al.* Randomised comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding in patients with persisting neurological dysphagia. *BMJ* 1992;304:1406-9. (30 May.)
- 2 Forgacs I, Macpherson A, Tibbs C. Percutaneous endoscopic gastrostomy. *BMJ* 1992;304:1395-6. (30 May.)
- 3 Moran BJ, Taylor MB, Johnson C. Percutaneous endoscopic gastrostomy: a review. *Br J Surg* 1990;77:858-62.
- 4 Moran BJ, Frost RA. Percutaneous endoscopic gastrostomy in 41 patients: indications and clinical outcome. *J R Soc Med* 1992;85:320-1.
- 5 Payne-James J, Silk DBA. Enteral nutrition: background, indications and management. *Baillieres Clin Gastroenterol* 1988;2:815-47.

EDITOR,—We have used percutaneous endoscopic gastrostomy feeding on several occasions with excellent results but wish to add a caveat regarding its use in chronic renal impairment.^{1,2}

A 63 year old woman started continuous ambulatory peritoneal dialysis in 1983 because of chronic renal failure secondary to polycystic kidney disease and atherosclerosis. In April this year the dialysis catheter was removed after persistent culture negative peritonitis and she was transferred to temporary intermittent haemodialysis. She later developed gangrenous toes secondary to peripheral vascular disease and underwent amputation below the right knee.

Because of poor oral intake, weight loss, and a low albumin concentration a percutaneous endoscopic gastrostomy tube was inserted under standard conditions. Six days later the patient developed severe abdominal pain, vomiting, absolute constipation, and peritonitis. At laparotomy the gastrostomy tube was found to lie in the peritoneal cavity, with leakage of enteral feed throughout the abdomen and an intense peritoneal reaction. The patient recovered well after lavage, repair of the gastrostomy wound, and a period of total parenteral nutrition but will be unable to have continuous ambulatory peritoneal dialysis in future.

This case shows that percutaneous endoscopic gastrostomy feeding should be used with caution in chronic renal impairment as displacement of the catheter may have serious consequences for future dialysis and, hence, quality of life. Nasogastric or

intravenous feeding continues to have a role in such circumstances.

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- 2 Forgacs I, Macpherson A, Tibbs C. Percutaneous endoscopic gastrostomy. *BMJ* 1992;304:1395-6. (30 May.)

AUTHORS' REPLY.—It is a pity that B J Moran and H T Khawaja did not read our study more carefully. Patients were randomised to percutaneous endoscopic gastrostomy or nasogastric tube feeding at first contact and had not received enteral nutrition before randomisation. During the minimum four weeks of dysphagia to fulfil the criteria for entry to the study most patients could take a little oral nutrition with intravenous fluid supplements if necessary. Enteral nutrition was considered if the patient's dysphagia progressed or no improvement had occurred after at least four weeks. Patients who were unhappy about either method of tube feeding were treated outside the study. Those patients who failed with nasogastric tube feeding (mean 5.2 days) were immediately switched to percutaneous endoscopic gastrostomy feeding.

Our study did not attempt to address the difficult ethical problem of when to provide nutritional support to patients with severe neurological disability. We have found, however, that the quality of life and rehabilitation of patients have been greatly improved by percutaneous endoscopic gastrostomy feeding.

The case described by Peter A Andrews and Michelle Webb illustrates the recognised danger of percutaneous endoscopic gastrostomy feeding in patients receiving continuous ambulatory peritoneal dialysis.¹ This method of dialysis is one of the few contraindications to insertion of a percutaneous endoscopic gastrostomy tube.

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- 1 Ponsky JL, Gauderer MWL. Percutaneous endoscopic gastrostomy: indications, limitation, techniques and results. *World J Surg* 1989;13:165-70.

EDITOR,—In their editorial Ian Forgacs and colleagues¹ refer to R H R Park and colleagues' study of percutaneous endoscopic gastrostomy compared with nasogastric tube feeding in patients with persisting neurological dysphagia² and effectively argue the case for percutaneous endoscopic gastrostomy as opposed to long term nasogastric feeding. They state that "although most gastroenterologists should be able to learn the technique, it is far from universally available."

The authors should have mentioned that percutaneous gastrostomy tubes can be easily and quickly inserted as a radiological procedure by one person. The stomach is inflated, usually with a fine bore nasogastric tube, then a needle is inserted percutaneously into the stomach so that a guidewire can be introduced. One or more dilating catheters are advanced over the wire into the stomach and then withdrawn, and a gastrostomy tube is introduced over the wire. The nasogastric tube can then be removed. The success rate and complication rate are similar to those of the endoscopic technique, although the incidence of wound sepsis is believed to be lower as the tube is not contaminated by oral flora before its passage through the abdominal wall.³

The endoscopic technique is indicated when the procedure must be performed at the patient's bedside. The radiological technique is indicated if endoscopic access to the stomach is prevented by an oesophageal tumour, when the radiologist may be able to gain access by using a catheter and shaped guidewire. Except in young children, exposure to radiation is not an issue as the fluoroscopy time can be kept to under five minutes. Tubes placed radiologically can readily be changed, and if reflux proves to be a problem the tube can easily be replaced by one that passes to the jejunum.

In summary, the radiological technique is quick, easily learnt, and, in my view, preferable for most patients to the endoscopic technique. Clinicians should ask their radiological colleagues to provide this service.

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- 1 Forgacs I, Macpherson A, Tibbs C. Percutaneous endoscopic gastrostomy. *BMJ* 1992;304:1395-6. (30 May.)
- 2 Park RHR, Allison MC, Lang J, Spence E, Morris AJ, Danesh BJZ, *et al.* Randomised comparison of percutaneous endoscopic gastrostomy and nasogastric tube feeding in patients with persisting neurological dysphagia. *BMJ* 1992;304:1406-9. (30 May.)
- 3 Halkier BK, Ho C, Yee ACN. Percutaneous feeding gastrostomy with the Seldinger technique: review of 252 patients. *Radiology* 1989;171:359-62.

EDITOR.—Several statements and assertions in the editorial on percutaneous endoscopic gastrostomy demand comment.¹ It is commonly agreed that percutaneous endoscopic gastrostomy is a useful technique that may be appropriate to consider for any patient requiring long term (more than three or four weeks) enteral nutrition, and the study by R H R Parks and colleagues confirms this.² The subtitle and tone of the editorial, however, are misleading as they seem to imply that nasogastric feeding has no place at all in enteral nutrition. This is of course untrue as most patients given enteral nutrition are fed for less than four weeks,^{3,4} when percutaneous endoscopic gastrostomy would be inappropriate. The main indication for enteral nutrition is not difficulty in swallowing due to neurological disease—that is the main indication for long term feeding. Medical and surgical patients and patients in intensive therapy units who cannot or will not eat on a short term basis make up most patients requiring enteral nutrition.^{3,4} Such patients tolerate fine bore naso-enteral tubes well with minimal complications.

In the only randomised controlled trial of operative (surgical) gastrostomy versus percutaneous endoscopic gastrostomy the complication rates were the same, possibly because the operative gastrostomy was done when possible under local anaesthesia.⁵ That study confirmed that most of the morbidity associated with operative gastrostomy previously reported was probably related to general anaesthesia. Percutaneous endoscopic gastrostomy tubes were cheaper to place than operative gastrostomy tubes.

A description of insertion of a percutaneous endoscopic gastrostomy tube is given, but it is not made clear that this represents only one example of several differing techniques. Percutaneous endoscopic gastrostomy has become widely used in the United Kingdom: in 1988 only 6% of centres replying to a national survey on nutrition practices used percutaneous endoscopic gastrostomy, compared with 74% in 1991.⁶ It is important to remember that percutaneous endoscopic gastrostomy is only one of many useful techniques for long term feeding. For example, radiologists are having considerable success in placing gastrostomy tubes under fluoroscopic control.⁷

Although most of us don't like the image of elderly patients with their hands bandaged to the