British Specialist Nutrition Association Ltd

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A Guide to Parenteral Nutrition

What is Parenteral Nutrition?

Parenteral nutrition (PN) is the provision of nutrition to patients intravenously via the veins in the form of a liquid infusion. The liquid infusion typically contains a nutritionally balanced combination of protein, carbohydrate, fat, minerals, electrolytes and vitamins.

PN is used by patients in England for approximately **1.2 million days per year**[3]

Who receives Parenteral Nutrition and why?

PN can be used in all ages from pre-term neonates (newly born) to the elderly. NICE Guideline CG32[1] states that PN should only be considered when a patient is malnourished, or at risk of malnutrition, due to either of the following:

- inadequate or unsafe oral and/or enteral nutritional intake
- a non-functional, inaccessible or perforated (leaking) gastrointestinal tract

When the intestine malfunctions, the short bowel can no longer provide sufficient absorption of the major nutrients (fat, protein and carbohydrate), electrolytes and water to maintain the integrity of body composition.[2]

The length of time a patient will receive parenteral nutrition varies from a few days to long-term or even lifelong provision at home.

All hospitals involved with PN should have a multidisciplinary nutrition team.[3]

Types of Parenteral Nutrition

Licensed three chamber bags (3CB)

Compounded standard bags

Individually tailored bags to meet a patient's specific requirements

There are 3 main types of PN:[4]

1.Licensed three chamber bags (3CB). The carbohydrate, amino acids and fat sources are in three separate chambers and are mixed prior to use. Unmixed, the bags can be stored at room temperature. The bags require the addition of vitamins and trace elements, in an aseptic unit, to become complete PN.

2.Compounded standard bags. Macronutrients, micronutrients and electrolytes are mixed in an aseptic unit to a fixed 'recipe'. Similar to mixed 3CBs, these have a shorter shelf life and require refrigeration.

3.Individually tailored bags to meet a patient's specific requirements. These are also manufactured in an aseptic unit and contain macronutrients, micronutrients and electrolytes. However, the majority of hospitals do not have such facilities and/or pharmacy staff to make up these bags.

Home Parenteral Nutrition (HPN)

HPN is indicated for patients with ongoing intestinal failure (IF) (type 3) but who are well enough to return to their community.[4] Supported by a homecare nursing team, many patients now survive over ten years with good quality of life on HPN.[2] Patients require a detailed care plan and good communication between the hospital multidisciplinary team and the community support team is essential.

[1] NICE Guideline [CG32]. 2006. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition [2] British Association for Parenteral and Enteral Nutrition (BAPEN). Home Parenteral Nutrition in the United Kingdom, a Position Paper. 2003 [3] Stewart JAD, Mason DG, Smith N, et al. (2010). A Mixed Bag. An enquiry into the care of hospital patients receiving parenteral nutrition. National Confidential Enquiry into Patient Outcome and Death (NCEPOD). Accessed online: www.ncepod.org.uk/2010report1/downloads/PN_report.pdf (July 2015) [4] Baker M, Harbottle L, 2014. Parenteral Nutrition. In: Gandy J (ed.) Manual of Dietetic Practice. Oxford: John Wiley & Son Ltd [5] Statutory Instruments. 2016 No. 186. Medicines. The Human Medicines (Amendment) Regulations 2016 [6] Inayet N, Neild P. 2015. Parenteral nutrition. J R Coll Physicians Edinb, 45, 45-8 [7] BAPEN. Organisation of Nutritional Support Within Hospitals. 2007. Accessed online: http://www.bapen.org.uk/ofnsh/OrganizationOfNutritionalSupportWithinHospitals.pdf (July 2016) [8] Royal College of Nursing. Standards for Infusion Therapy. 2010. Accessed online: http://www.bbraun.it/documents/RCN-Guidlines-for-IV-therapy.pdf (Jan 2016) [9] Harvey S et al. Trial of the route of early nutritional support in critically ill adults. N Engl J Med 2014; 371: 1673-1684 [10] Singer P, et al. ESPEN guidelines on parenteral nutrition: intensive care. Clinical Nutrition 2009; 28, 387-400

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Prescribing Parenteral Nutrition

PN is provided to patients on prescription. Until April 2016, PN treatment was recommended by a dietitian or a nurse and prescribed by an independent prescriber, such as a doctor or pharmacist. Changes to the Human Medicines Regulation in 2016[5] has allowed dietitians to qualify as supplementary prescribers, allowing advanced nutrition support dietitians to prescribe PN according to an agreed clinical management plan. In the hospital setting, specialised commissioning covers the cost of PN, whereas HPN is covered under HPN Framework.

Staff Involved in Parenteral Nutrition

PN in an acute hospital setting should be managed by a multidisciplinary nutrition support team (NST), which may include: doctors, dietitians, a specialist nutrition nurse, other nurses, pharmacists, biochemistry and microbiology laboratory support staff, and other allied healthcare professionals (for example speech and language specialists).[1] Having a NST has been shown to improve patient outcomes and save costs.

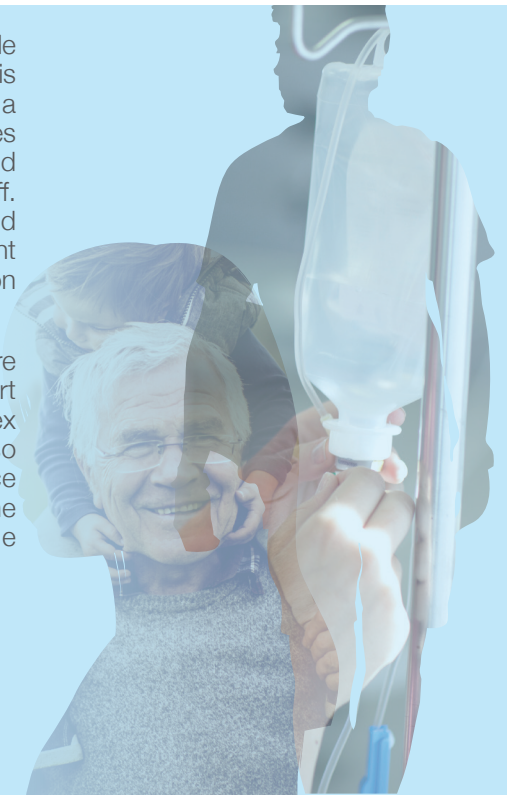
The central line will usually be inserted by the specialist nurse, while the bag of nutrient solution will be connected by ward nurses under aseptic conditions on a daily basis. The dietitian is responsible for calculating the patient's energy and nutrient requirements, which then informs the PN prescription.

The remit of the pharmacist is to provide the PN prescription and check that it is stable and therefore safe to give to a patient. The specialist nurse oversees the nursing aspects of patient care and is involved in the training of ward staff. The chemical pathologists and microbiologists have an important role in the monitoring of the provision of PN.[6]

A nutrition support and intestinal failure service can provide treatment, support and advice to patients with complex gut disorders. This service can also offer a pharmacy aseptic service where all PN used throughout the Trust is prepared under sterile conditions by highly trained staff.[7]

40%

of hospitals administering PN do not have a Nutrition Support Team[3]



The Value PN Brings to Patient Care

Parenteral Nutrition…	
Supports positive health outcomes[5]	Poor nutritional status may reduce a patient's quality of life and increase their risk of morbidity and mortality. PN can offer a lifeline to patients who are unable to receive adequate nutrition through oral or enteral feeds.
Is quality assured	PN is highly regulated and must conform to standards set by the Medicines and Healthcare Products Regulatory Agency (MHRA), the government agency responsible for regulating medicines and medical devices. In order for a product to be licensed it must have undergone rigorous clinical trials and manufacturers must receive MHRA certification.[8]
Can be tailored to meet an individual patient's specific needs	Patients receiving PN can have very specific requirements. 21.8% of PN is provided in bespoke PN bags[3] that are unique to each patient.[9]
Supports and aids recovery from a range of medical interventions	New research has resulted in increased use of PN to support hospitalised patients receiving aggressive chemotherapy for haematological problems, bone marrow transplantation and new surgical procedures.[10]
Can be delivered at home	Around 1,500-1,800 patients in the UK receive PN at home at any one time, improving their quality of life. Patients are able to leave hospital and receive life-saving nutrition treatment in the comfort of their own homes.

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BSNA is the voice of the specialist nutrition industry in the UK
10 Bloomsbury Way, Holborn, London WC1A 2SL • Tel: 020 7836 2460 • secretariat@bsna.co.uk • www.bsna.co.uk