



Review

Guidelines recommendations on care of adult patients receiving home parenteral nutrition: A systematic review of global practices[☆]

Mira Dreesen^{a,*}, Veerle Foulon^b, Kris Vanhaecht^c, Lutgart De Pourcq^a, Martin Hiele^d, Ludo Willems^a

^a Pharmacy Department, University Hospitals, Leuven, Belgium

^b Pharmacy Department, Research Centre for Pharmaceutical Care and Pharmaco-economics, Catholic University Leuven, Belgium

^c Center for Health Services and Nursing Research, School of Public Health, Leuven, Belgium

^d Department of Gastroenterology, University Hospitals, Leuven, Belgium

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SUMMARY

Background & aims: Because home parenteral nutrition (HPN) in adult patients can give rise to a variety of complications, good guidance is necessary. To achieve this, clarity and consistency in guidelines are essential. The aim of this review is to identify and compare evidence-based guidelines, and to compile a list of main recommendations, according to their evidence-based grade.

Methods: We searched Medline and the international guideline database for HPN guidelines, performed a content analysis of retrieved guidelines, and evaluated their quality. We then compiled a comparative table of guideline recommendations along with their assigned level of evidence.

Summary of results: Six systematically developed evidence-based guidelines and one expert opinion-based standard for home care were retrieved. Of these guidelines, two were exclusively devoted to HPN. Although the guidelines generally covered the same topics, most did not provide information on intravenous medication, bone metabolic disease, and indications in patients with malignant disease. Moreover, we found grading discrepancies among various guidelines, as identical recommendations were often labeled with different grades.

Conclusion: Our comparison of guidelines and standards for HPN revealed substantial differences among recommendations. Identification of these discrepancies and omissions should facilitate the development of more comprehensive and better justified guidelines in the future.

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1. Introduction

Parenteral nutrition (PN) is provided to patients who are unable to maintain their nutritional status by oral or enteral intake because of intestinal failure. Since the 1960s and 1970s, patients receiving PN can be treated at home.¹ This is usually referred to as 'home parenteral nutrition' (HPN), which can be a life-saving or life-extending therapy. In Europe, the most common indications for long-term HPN are Crohn's disease, mesenteric vascular disease, cancer, and radiation enteritis.² These indications are similar to those in the United States (U.S.).³

The treatment of patients on HPN is not without risks. Catheter-related infections, liver disease, and metabolic bone disease are the

most common complications related to long-term PN.³ The prevalence of catheter-related bloodstream infections ranges between 0.38 and 0.50 episodes per catheter year.⁴ The weighted average of catheter occlusion has been estimated to be 0.071 episodes per catheter year and 0.027 for central vein thrombosis.⁴ In addition to catheter-related complications, substantial liver damage and ultimately end-stage liver disease can also occur in patients on HPN.⁵ The cause of this complication is complex and remains unclear but may involve patient-related and nutrition-related factors. Abnormal liver function tests have been reported in 48% of patients⁶ on HPN, with elevated alkaline phosphatase levels being the most common finding. Finally, HPN patients may experience metabolic bone disease in the form of osteomalacia or osteoporosis, or both.⁷ Several factors can contribute to this complication, such as underlying disease, presence of bone-toxic products (e.g., aluminum) in the total parenteral nutrition (TPN) mixture, or lack of essential nutrients for bone homeostasis in the TPN mixture.⁸

To minimize these complications, patients require careful monitoring. Effective patient monitoring requires applying clear

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* Corresponding author. Pharmacy Department, University Hospitals, Herestraat 49, P.O. Box 7003, 3000 Leuven, Belgium. Tel.: +32 16342338; fax: +32 16343084. E-mail address: mira.dreesen@uzleuven.be (M. Dreesen).

and comprehensive guidelines not only at the start of therapy but also during home care and follow-up. Hence, the aim of this review is to gain evidence-based insight into how patients on HPN should be managed. To this end, we searched in the medical literature for HPN guidelines, compared these, and composed a comprehensive list of the most important recommendations based on the level of evidence.

2. Methods

Medline and the international guideline database of the Belgian Cochrane Centre (CEBAM)⁹ were searched for published evidence-based guidelines on adult HPN patients. The following search string was used: ((total parenteral nutrition, home OR home parenteral nutrition OR parenteral nutrition, home OR home total parenteral nutrition) AND (practice guideline)) AND (parenteral nutrition OR home care services OR home care OR home parenteral nutrition). The search strategy was restricted to English and Dutch language articles. Relevant articles cited in the bibliographies of primary candidate articles were culled for further review.

Two independent researchers assessed the quality of the process and reporting of the guideline development using the Appraisal of Guidelines Research and Evaluation (AGREE) instrument.¹⁰ Overall assessment and domain scores were calculated as instructed in the AGREE manual. Guidelines were included if the majority of items scored high (3 or 4) and if most of the domain scores (4 or 5) were above 60%.

We performed a content analysis of the guidelines, focusing on whether guidelines mentioned certain themes concerning HPN for adult patients. Guidelines with sections providing general information on PN were screened as a whole for relevant words such as long-term parenteral nutrition, home-specialized nutrition support, financial, or education.

Next, we categorized the guidelines according to their themes and compiled a comparative table of guideline recommendations. A distinction was made between recommendations from guidelines

exclusively devoted to HPN and guidelines providing more general information on HPN. Recommendations were included in the comparative table if they were present in all the guidelines exclusively devoted to HPN. However, if one of the two guidelines exclusively devoted to HPN did not include a specific topic or theme, e.g., bone metabolic bone disease, the guidelines providing more general information on HPN were also taken into account. A particular recommendation was then only included in the table if (1) all the general guidelines agreed on the recommendation of the HPN-specific guideline, or (2) if at least 30% of the general guidelines gave the recommendation a C grade.

3. Results

3.1. Guideline inclusion

Of the 38 candidate papers initially identified in Medline, 3 met our criteria and were included for review. These were two evidence-based guidelines exclusively devoted to HPN, one from the European Society of Parenteral and Enteral Nutrition (ESPEN 2009)¹¹ and one from the Australasian Society of Parenteral and Enteral Nutrition (AuSPEN 2008).¹² The remaining article, from the German Society for Nutrition Medicine (DGEM 2009),¹³ covered HPN in a more general guideline.

Of the 27 candidate guidelines retrieved from the international guideline database,⁹ only one guideline was included in our review. It covered HPN in general and was developed by the National Institute for Health and Clinical Excellence (NICE 2006).¹⁴

Manual searching the bibliographies of included guidelines produced three additional documents. Two were from the American Society for Parenteral and Enteral Nutrition (ASPEN), which penned a more general evidence-based guideline¹⁵ and standards about home care services.¹⁶ The latter document is a standard and presents a range of care interventions based on expert clinical opinion. The third document, an evidence-based guideline concerning central venous catheters, is an important addition to the

Table 1
Overview of included articles.

Reference	Country	Scope	Guideline or standard developer	Title	Methods used
ASPEN (2002) ¹⁵	US	General Parenteral and enteral nutrition	American Society for Parenteral and Enteral Nutrition (ASPEN) board of directors with Clinical guidelines Task Force (CGTF)	Guidelines for the use of parenteral and enteral nutrition in adult and pediatric patients.	Section authors reviewed and summarized primary literature and formulated guideline statements.
ASPEN 2005 ¹⁶	US	General Home care patients	American Society for Parenteral and Enteral Nutrition (ASPEN) board of directors and Standards committee	Standards for specialized nutrition support: home care patients.	Based on expert clinical opinion.
NICE ¹⁴	England and Wales	General Oral, parenteral nutrition and enteral tube feeding	Guideline Development Group (GDG) convened by National Collaborating Centre for Acute Care (NCC-AC) with guidance from National Institute for Health and Clinical Excellence (NICE).	Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition.	The GDG worked on informal consensus basis to formulate and grade recommendations. In final stages recommendations were further revised.
AuSPEN ¹²	Australia and New Zealand	Specific Home parenteral nutrition	Multidisciplinary working party of Australia and New Zealand health professionals formalized into AuSPEN HPN Guideline Development Group (GDG).	Clinical practice guideline for home parenteral nutrition patients in Australia and New Zealand.	Draft guideline developed by GDG consensus, peer-reviewed by both countries and by internationally recognized home parenteral nutrition practitioners.
ESPEN ¹⁷	Europe	Central venous catheters	The European Society of Parenteral and Enteral Nutrition (ESPEN) Clinical Practice guidelines (CPG) program	Guidelines on Parenteral nutrition: Central Venous catheters (access, diagnosis and therapy of complications).	Working group approved guidelines that are reviewed by two independent external reviewers. Thereafter, 3 further reviewers were selected by the editorial board of Clinical nutrition. ³¹
ESPEN ¹¹	Europe	Specific Home parenteral nutrition	The European Society of Parenteral and Enteral Nutrition (ESPEN) Clinical Practice guidelines (CPG) program. ³¹	Guidelines on Parenteral nutrition: Home Parenteral Nutrition (HPN) in adult patients.	Same method as for ESPEN guideline concerning central venous catheters.
DGEM ¹³	Germany	General Parenteral nutrition	German Society for Nutritional Medicine in collaboration with specialist medical associations ¹³	Guidelines on parenteral nutrition from the German Society for Nutrition Medicine (DGEM).	The working group carried out literature search and assessed scientific evidence. To obtain ultimate guidelines consensus conferences were used.

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