Complete Summary

GUIDELINE TITLE

Ordering parenteral nutrition. In: Safe practices for parenteral nutrition.

BIBLIOGRAPHIC SOURCE(S)

Mirtallo J, Canada T, Johnson D, Kumpf V, Petersen C, Sacks G, Seres D, Guenter P, Task Force for the Revision of Safe Practices for Parenteral Nutrition. Ordering parenteral nutrition. In: Safe practices for parenteral nutrition. [published erratum appears in JPEN J Parenter Enteral Nutr. 2006 Mar-Apr;30(2):17]. JPEN J Parenter Enteral Nutr 2004 Nov-Dec;28(6):S43-8. [22 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Conditions or disease states requiring parenteral nutrition

GUIDELINE CATEGORY

Management
Technology Assessment

CLINICAL SPECIALTY

Family Practice
Geriatrics

Internal Medicine
Nursing
Nutrition
Pediatrics
Pharmacology

INTENDED USERS

Advanced Practice Nurses
Dietitians
Hospitals
Nurses
Pharmacists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To provide guidelines with supporting evidence to foster quality parenteral nutrition (PN) therapy
- To reduce errors and improve safety in patients receiving parental nutrition
- To provide a set of minimum standards for creating a parenteral nutrition order

TARGET POPULATION

Adult and pediatric patients receiving parental nutrition

INTERVENTIONS AND PRACTICES CONSIDERED

1. Development and design of standardized order forms for parenteral nutrition (PN)
2. Assessment of the PN formulation for appropriateness to patient age and disease state
3. Use of total daily dose rather than percent concentration in PN orders
4. Avoidance of potentially dangerous abbreviations and dose expressions
5. Re-writing of all components of the PN order when PN is reordered

MAJOR OUTCOMES CONSIDERED

Frequency, severity, and type of prescribing errors related to orders for parenteral nutrition therapy.

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The Task Force reviewed existing published literature in electronic databases and secondary source literature on order writing practices for parenteral nutrition.

Because clinical guidelines cannot be based solely on prospective randomized trials, the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Task Force for Revision of Safe Practices for Parenteral Nutrition conducted the 2003 Survey of Parenteral Nutrition (PN) Practices, focusing on policies and procedures relating to ordering, compounding, and administering PN and quality oversight of this process (see "Availability of Companion Documents" field). The final document published as "Safe Practices for Parenteral Nutrition" was based primarily on the recommendations of experts in the field and was evidence-based for as much as the literature provided evidence to support these recommendations. The results from this survey were used as a basis for the revised "Safe Practices for Parenteral Nutrition" to enhance the quality and efficacy of nutrition support.

Development of the Survey Instrument

One of the survey objectives was to identify common practices related to ordering and compounding, administration of PN, and quality oversight of this process. A questionnaire based upon the existing A.S.P.E.N. "Safe Practices for Parenteral Nutrition" was developed to obtain an overview of the variance and consistency with current practices from a variety of healthcare settings. It was designed to include both hospital- and non-hospital-based PN practices. The survey instrument was not tested or validated before its distribution, but it was reviewed by a multidisciplinary panel of nutrition support practitioners and revised before becoming available for participant responses. The survey was administered electronically through the A.S.P.E.N. website and announced to the membership via society journals and A.S.P.E.N. list servers. Announcements inviting participation were also sent to selected professional groups, including the American College of Clinical Pharmacy, the American Society of Health-System Pharmacists, the National Home Infusion Association, and others. Participation in the survey was completely voluntary. The survey instrument consisted of 45 questions with multiple-choice and free-text responses. It was organized into 5 sections: demographics of the respondent, writing PN orders, computer order entry of PN orders, problems with PN orders, and adverse events related to PN. Questions in the demographic section focused on information such as professional background (i.e., MD, RN, RD, RPh, other) and primary practice setting (i.e., hospital, homecare, etc). The order writing section was designed to identify the discipline responsible for writing PN orders, whether or not standard PN order forms were used, and the manner in which PN components were ordered (i.e., dextrose in percent final concentration vs g/day, electrolytes in mEq/L vs per day, etc). The computer order entry section was designed to quantitate the use of computerized order entry systems and automated compounding devices. The final 2 sections, problems and adverse events related to PN, were developed to capture the type and frequency of harm associated with the compounding and administration of PN formulations.

Data Collection

The survey was announced on the A.S.P.E.N. website, in the society journals (e.g., *Journal of Parenteral and Enteral Nutrition*, *Nutrition in Clinical Practice*), and list servers (e.g., ASPENet) between June 1 and 30, 2003. Messages were subsequently posted to inform potential respondents of the deadline for final submission of survey responses. Participants were assured that their responses would be confidential and that only aggregate responses would be reported.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Data Analysis

Descriptive statistics were used to characterize the frequencies of surveyed practices. Questions with free text responses were analyzed for content to determine if the responses were significant to the study. Data were analyzed with the SPSS 11.5 (SPSS, Inc, Chicago, IL) statistical package. Frequency data were assessed with chi-squared. The *a priori* level of significance was set at ≤ 0.05.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Realizing that the original Safe Practice guidelines were not consistently implemented, the Task Force used this information to identify practices pertinent to the revision of the Safe Practice guidelines. The survey results presented in this document are those findings pertinent to the development of the guideline. This snapshot of current practices and expert opinion or consensus provided by both external and internal reviews was compiled into the current Safe Practices.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

This document was internally reviewed by the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Standards Committee as well as the Dietetic, Nursing, Medical, and Pharmacy Practice Sections and approved by the A.S.P.E.N. Board of Directors after external review by individuals and other associations of health care professionals.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

1. Standardized order forms (or order entry screens) shall be developed and designed for adult and pediatric parental nutrition (PN) formulations to aid prescribers in meeting the estimated daily patient nutritional requirements and improve order clarity.
2. The clinician and compounding pharmacist shall assess the PN formulation to determine whether its contents are within an acceptable standard range based on the specific patient population (e.g., adult or pediatric). They shall also assess whether a clinical disease state or condition warrants a dose outside the standard range.
3. The use of percent concentration in PN orders should not be used. The use of total daily dose is encouraged.
4. Potentially dangerous abbreviations and dose expressions should be avoided. Specifically:
    - Do not use trailing zeros (e.g., 5 mg, and not 5.0 mg)
    - Use leading zeros for doses less than one measurement unit (e.g., 0.3 mg and not .3 mg)
    - Spell out the word UNITS (e.g., never U which could be easily mistaken as a zero)
    - Spell out routes of administration and all intended instructions.
5. All components of the PN order must be re-written when PN is reordered.

Components of PN Order Forms

Mandatory for the PN Order Form

- Clarity of the form
    - Clearly written and understandable to anyone who might utilize it
    - Organized and easy to scan for completeness
    - Complete enough to address anticipated institution specific concerns
    - Ingredients listed in same order as PN label
    - Decimals and percent concentrations avoided
    - All components ordered in grams/milligrams/milliequivalents/millimoles per day or per kg per day
- Contact number for person writing the order
- Contact number for assistance with PN ordering
- Time by which orders need to be received for processing
- Location of venous access device (central or peripheral)
- Height, weight/dosing weight, diagnosis, PN indication
- Hangtime guidelines
- Institutional policy for infusion rates
- Information regarding potential incompatibilities

Strongly Recommended for Inclusion on PN Order Form

- Educational tools (e.g., dosing guidelines)
- Guidelines to assist in nutrient/volume calculations
- Recommended PN lab tests (baseline, monitoring, and special circumstances)
- Guidelines for stopping/interrupting PN
- Contents of multivitamin and trace element preparations
- Brand names of products (e.g., amino acids, intravenous fat emulsions [IVFE])
- Guidelines for use of insulin
- Guidelines for recognizing additional calorie sources

Worthy of Consideration for Inclusion on PN Order Form

- Identification of who will review the order, in addition to pharmacy
- Guidelines for nutrient restriction in various disease states
- Guidelines for long-term PN (e.g., Selenium, Iron administration)
- Guidelines for special amino acids (e.g., Trophamine + cysteine)

A sample adult PN order form is shown in Figure 1 in the original guideline document.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are supported by a review of the literature as well as a review of parenteral nutrition order forms submitted by responders to the 2003 American Society for Parenteral and Enteral Nutrition Survey.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Implementation of standardized order writing processes for parenteral nutrition will reduce prescription errors and improve patient safety.

POTENTIAL HARMS

It should be noted that one study reported an increase in prescriber errors after a standardized parenteral nutrition (PN) form was introduced. In this study, problems occurred with PN infusion rates, electrolyte composition, and amino acids concentration, when using a standardized PN order form. Therefore, creating and maintaining a standardized PN order form that meets the needs of patients and minimizes errors still requires a continual quality assurance effort and patient safety commitment by each institution.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Practice Guidelines for Safe Practices for Parenteral Nutrition are based upon general conclusions of health professionals who, in developing such guidelines, have balanced potential benefits to be derived from a particular mode of providing parenteral nutrition feeding formulations. The underlying judgment regarding the propriety for any specific practice guideline or procedure shall be made by the attending health professional in light of all the circumstances presented by the individual patient and the needs and resources particular to the locality. These guidelines are not a substitute for the exercise of such judgment by the health professional, but rather are a tool to be used by the health professional in the exercise of such judgment. These guidelines are voluntary and should not be deemed inclusive of all proper methods of care or exclusive of methods of care reasonably directed toward obtaining the same result.
- Unfortunately, there is little, if any, published evidence to support good practices in the area of parenteral nutrition ordering and administration. Although data from randomized clinical trials of nutrition support are ideal for developing clinical practice guidelines, this type of information is not widely available. Several factors inherently limit the use of prospective randomized clinical trials in the evaluation of nutrition support. Those most likely to benefit from the treatment (e.g., severely malnourished patients) cannot be randomized to an unfed control group due to ethical dilemmas. Other limitations include outcome results influenced by clinical variables independent of nutrition support and inability to recruit large numbers of eligible individuals from 1 medical center, contributing to the enrollment of marginal candidates for nutrition support.

Special Considerations

According to the 2003 Survey of Parental Nutrition (PN) Practices, the computerized prescriber order entry (CPOE) system for PN orders is used in only 29% of organizations surveyed. The best CPOE method or process for PN orders is not yet described in the literature. Converting standard paper orders to the computer creates unique challenges. For example, one institution utilizing CPOE has noted problems when an adjusted or dosing weight that is different from the patient's actual or admission weight is used when calculating caloric and protein requirements.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Chart Documentation/Checklists/Forms
Patient Resources
Resources

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

End of Life Care
Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Mirtallo J, Canada T, Johnson D, Kumpf V, Petersen C, Sacks G, Seres D, Guenter P, Task Force for the Revision of Safe Practices for Parenteral Nutrition. Ordering parenteral nutrition. In: Safe practices for parenteral nutrition. [published erratum appears in JPEN J Parenter Enteral Nutr. 2006 Mar-Apr;30(2):17]. JPEN J Parenter Enteral Nutr 2004 Nov-Dec;28(6):S43-8. [22 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Dec

GUIDELINE DEVELOPER(S)

American Society for Parenteral and Enteral Nutrition - Professional Association

SOURCE(S) OF FUNDING

American Society for Parenteral and Enteral Nutrition

GUIDELINE COMMITTEE

Task Force for the Revision of Safe Practices for Parenteral Nutrition

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force Members: Jay Mirtallo, MS, RPh, BCNSP, Chair; Todd Canada, PharmD, BCNSP; Deborah Johnson, MS, RN; Vanessa Kumpf, PharmD, BCNSP; Craig Petersen, RD, CNSD; Gordon Sacks, PharmD, BCNSP; David Seres, MD, CNSP; Peggi Guenter, PhD, RN, CNSN

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available to subscribers of the American Society for Parenteral and Enteral Nutrition (ASPEN) Guideline and Standards Library.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 727-4567.

AVAILABILITY OF COMPANION DOCUMENTS

The following background documents are available:

- Preface. Safe practices for parenteral nutrition. 4 p. 2004 Dec.
- Introduction. Safe practices for parenteral nutrition. 2 p. 2004 Dec.

The following documents are also available:

- Standards of practice. Definition of terms, style, and conventions used in A.S.P.E.N. guidelines and standards. 2005 Apr. 5 p.
- Parenteral nutrition safe practices: results of the 2003 American Society for Parenteral and Enteral Nutrition Survey. 2006 Jun. 7 p.
- A sample adult parenteral nutrition order form is available in the original guideline document.

Print copies: Available from the American Society for Parenteral and Enteral Nutrition (ASPEN), 8630 Fenton St, Suite 412, Silver Spring, MD 20910-3805; (800) 727-4567.

A CD-ROM tutorial: Writing PN orders is available for purchase from the American Society for Parenteral and Enteral Nutrition Web site.

PATIENT RESOURCES

The following is available:

- The A.S.P.E.N. nutrition support patient education manual. Silver Spring (MD): American Society for Parenteral and Enteral Nutrition, 2007. 427 p.

Print copies: Available for purchase from the American Society for Parenteral and Enteral Nutrition Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

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