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A.S.P.E.N. Parenteral Nutrition Safety Consensus Recommendations: Translation Into Practice

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Parenteral nutrition (PN) serves as an important therapeutic modality that is used in adults, children, and infants for a variety of indications. The appropriate use of this complex therapy aims to maximize clinical benefit while minimizing the potential risk for adverse events. Despite being classified and acknowledged as a high-alert medication,[1] only 58% of organizations have precautions in place to prevent errors and patient harm associated with PN.[2] Complications can occur as a result of the therapy and as the result of the PN process. The American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Parenteral Nutrition Safety Consensus Recommendations are based on practices that are generally accepted to minimize errors with PN therapy. However, the broad range of healthcare settings in which PN administration occurs—from critical care to home care—raises the potential for disparities to exist in the knowledge and skills of the healthcare professionals responsible for PN prescribing, review, preparation (including compounding, labeling, and dispensing), and administration. Regardless of the setting or the number of patients treated in a given facility, the classification of PN as a high-alert medication requires all healthcare organizations to develop evidence-based policies and procedures related to PN. With these concepts in mind, the A.S.P.E.N. Parenteral Nutrition Safety Task Force developed the A.S.P.E.N. Parenteral Nutrition Safety Consensus Recommendations, available online in the *Journal of Parenteral and Enteral Nutrition* (*JPEN*) in late 2013 and published in March 2014.[3]

The last version of the A.S.P.E.N. Safe Practices for Parenteral Nutrition document was published in 2004.4 At that time, a survey was conducted on current practices for PN and published in 2005.5 This survey of current practice was repeated in 2011, and despite what the authors of the Safe Practices document thought was wide dissemination of their recommendations, not much had actually improved in practice over those 8 years.6 With this in mind, the Consensus Recommendations task force put into place a wider dissemination protocol using a variety of promotional techniques and tool development that will be described in this article.

Dissemination of the Article

The A.S.P.E.N. Parenteral Nutrition Safety Consensus Recommendations were published in *JPEN* online using an open-access option such that the paper did not require a subscription or A.S.P.E.N. membership for readers to access it. This allowed the A.S.P.E.N. staff to send the link to the article to over 30 clinical, safety, regulatory, and accrediting organizations representing many disciplines and clinicians in a variety of healthcare settings. Since the online release of the article, over 10,340 full-text downloads of the paper have occurred. The task force also strategized on ways the paper could be translated into educational offerings for members and nonmembers of A.S.P.E.N. This has resulted in actual or planned presentations at the American Society of Health-System Pharmacists (ASHP) meetings, CNW13 and 14, Infusion Nurses Society, and multiple chapter and section meetings. A.S.P.E.N. held a 4-part series of training webinars on the topic in March 2014 to educate all members of the healthcare team who work with PN in order to optimize their knowledge base of safe PN practices. Attendants received a Certificate of Training in Parenteral Nutrition Safety if they participated in all 4 parts and claimed continuing education credit.

Development of a Toolkit and Customizable Tools

Another effort to help translate the PN safety recommendations was the development of a PN safety toolkit (www.nutritioncare.org/pnsafety). The purpose of this toolkit was to bring together helpful tools and resources clinicians need to bring optimal PN therapy to patients. This toolkit offers the Consensus Recommendations and a series of tools and checklists that will be described below. It also includes related publications, educational offerings, drug shortages information, and connections to the Parenteral Nutrition Adverse Event/Error Reporting Program developed in conjunction with the Institute of Safe Medication Practices (ISMP). A short overview of the Consensus recommendations was provided to attendees at the 2013 ASHP Midyear meeting in order to communicate the essential points of the document (see Figure 1).

Safety Checklists

In 2009, surgeon and journalist Dr Atul Gawande published the simple idea of the checklist as a tool to help deal with the complexities of healthcare.[7] He felt that errors occur due to the volume and complexity of knowledge and how it has exceeded the ability of clinicians to properly deliver consistent and safe care to patients. He makes a compelling argument that we can do better by using the simplest of methods: the checklist. He revealed what checklists can do, what they can't, and how they could bring about striking improvements in a variety of fields, from medicine and disaster recovery to professions and businesses of all kinds. A simple surgical checklist from the World Health Organization has been adopted in more than 20 countries as a standard for care. With this in mind, the task force created a series of checklists to assist in communication, protocol development, and delivery of safe care around PN prescribing, order review, compounding, and administration. These 4 checklists are available at www.nutritioncare.org/pnsafety. An example of the order review and verification and administration checklists can be found in Figures 2 and 3. Documentation at each step of the PN process may include checking each box and signing off on the checklist, which can then be maintained as part of the permanent record.

PN Administration **Checklist**

PURPOSE OF THIS CHECKLIST: The American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) champions the best evidence-based practices that support parenteral nutrition therapy in varying age populations and disease states. Approximately 350,000 patients in the U.S. receive parenteral nutrition (PN) during hospital stays and many more receive PN at home and in alternative care settings (www.hcupnet.ahrq.gov). The appropriate use of this complex therapy aims to maximize clinical benefit while minimizing the potential risks for adverse events.

- ☐ **Perform hand hygiene**
- ☐ **Use sterile technique when manipulating vascular access device**
- ☐ **Inspect PN container, check for:**
  - ☐ Integrity of container: no defects or leaks present
  - ☐ No visible particles or precipitates
  - ☐ No oiling, streaking, clumping, or separation
- ☐ **Confirm correct formulation, check for:**
  - ☐ Patient's name on label
  - ☐ Match all components listed on the label against the PN order
  - ☐ Route of administration (central vs peripheral)
  - ☐ Documentation of proper VAD tip placement
  - ☐ Start time
  - ☐ Infusion rate with taper if appropriate
  - ☐ Beyond use date and time
- ☐ **Verify patient identification**
  - ☐ Confirm patient identity using two identifiers
  - ☐ Inspect armband (not applicable in home care)
- ☐ **Initiate PN infusion**
  - ☐ Use appropriate size filter on distal end of tubing
  - ☐ Spike container
  - ☐ Prime tubing
  - ☐ Set infusion pump settings using double check
  - ☐ Trace catheter system to point of origin
  - ☐ Disinfect needleless adapter on VAD hub
  - ☐ Connect PN to patient
  - ☐ Initiate PN infusion at prescribed rate
- ☐ **Initiate monitoring protocol which includes:**
  - ☐ Patient response
  - ☐ Glucose monitoring
  - ☐ Serial weights
  - ☐ Intake and Output
  - ☐ Bloodwork
  - ☐ Vital signs

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For full recommendations, rationale, and references, go to Ayers P, Adams S, Boullata J, Gervasio J, Holcombe B, Kraft M, et al. A.S.P.E.N. Parenteral Nutrition Safety Consensus Recommendations. *JPEN J Parenter Enteral Nutr.* 2013.

www.nutritioncare.org/pnsafety

www.nutritioncare.org

Convincing Your Organization to Make Changes

Another step in translating recommendations to practice includes convincing your institution to make improvements to policies, protocols, and practices. Another set of tools to help with this process can be found at www.nutritioncare.org/pnsafety and are called *How to Make Changes in Your Institution*. These tools will help to prepare a presentation to your institution's Pharmacy and Therapeutics and/or Nutrition Committees. It starts off with a checklist of questions you should answer prior to the presentation, as seen in Figure 4.

Once these data are gathered through the checklist, you are ready to prepare a presentation. Another helpful tool here is a customizable PowerPoint program entitled "Improving Parenteral Nutrition (PN) Safety: Prescribing and Labeling in Our Facility." You can insert your data, the name of your institution, and the gaps you have identified as compared with best practices, and then present this program to your administrators, encouraging your care teams to make changes. Finally in this toolkit are the order and labeling templates in Word that will again allow you to customize your order and labeling system to be in compliance with the A.S.P.E.N. recommended methods. A description of another institution's quality improvement initiatives around the PN process can also be instructive.[8,9]

PN Safety Preparation Checklist

☐ Learn how many PN admixtures are used by your institution daily

Patient Group	In-house Compounded		Outsource Compounded	Commercially Premade
	Customized	*Standardized*		
Adult				
Pediatric				
Neonate				

- If outsourcing is utilized, have compounding pharmacies been visited and inspected?

☐ List the members of the Pharmacy and Therapeutics (P & T) Committee or Nutrition Committee if appropriate. Consider introducing yourself to them ahead of time.

☐ Identify key individuals from medicine, pharmacy, nutrition, nursing and information technology with an interest in PN and/or medication safety. Get to know them and advocate for their support.

☐ List the members of the formal or informal nutrition support team (adults and pediatrics)

☐ List the clinicians with nutrition support certification (CNSC, BCNSP) in your institution

☐ Trace the flow map that best represents the PN-use process at your institution

- Compare with best practices described in A.S.P.E.N. documents
- Select one node of the process as a focus of safety (e.g., prescribing, order review, compounding, labeling & dispensing, storage & administration, or documentation)

Prescribing

☐ Evaluate your electronic and/or paper PN order forms and compare with A.S.P.E.N. templates and recommendations.

Electronic Order Entry: CPOE

- Is the entry process standardized as per A.S.P.E.N. templates?
- Are dosing guidelines and decision support tools built into the system?
- Can the order be submitted before all required fields are complete?
- Are check boxes used instead of free text?
- If free text is used, is the space limited?
- Does the program auto-populate as many fields as possible?
- Does the order interface with the automated compounding device on which PN is prepared?

Paper Order Form:

- Are the forms standardized as per A.S.P.E.N. templates?
- Are they handwritten or can they be completed using word processing?
- Do they match the order entry sequence when transcribed onto the computer?

☐ Determine the process for revision of the PN order process or CPOE in your institution

☐ Order Review
- Who is the pharmacist dedicated to review the daily PN orders? Are they board-certified? Do they perform both a clinical review and a pharmaceutical review of each patient's PN order?

☐ Evaluate the PN Labels for bags compared with the A.S.P.E.N. templates

Example: is component sequence and units of measure the same between the order form and label?

☐ Determine the process for revision of the PN labels in your institution

Documentation

☐ Determine if your institution has a Medical Safety Officer or Equivalent

☐ Learn if PN errors are collected, analyzed and reported in your institution

☐ Describe your institution's procedure for coping with Drug Shortages

- How is this communicated with prescribers, nutrition support team, and the P&T Committee?
- Which of the PN component items are unavailable? For how long? Have alternate sources been evaluated?
- Have alternate suppliers of products been inspected or certified? What are the obstacles to obtaining the unavailable products?
- Do you have management protocols such as those provided by A.S.P.E.N.? (www.nutritioncare.org/drugshortages)

☐ Identify champions for PN Safety in your institution who can assist with the process

- Making changes to the process
- Finding out how to collect data before and after changes are made to assess impact

Conclusion

The PN Safety Consensus Recommendations have set the best practices and the author group has now provided tools to make these recommendations as easy as possible to understand, communicate with others, and implement in your institutions.

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