Pharmacist-Driven Interdisciplinary Computerized Order Entry (COE) for Parenteral Nutrition

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Background

Although computerized order entry (COE) has been in place for many years in our 700-bed academic medical center, the facility continued to rely on a paper/pen system for parenteral nutrition (PN) orders (18 adult patients daily). The complexity of PN orders and the need for frequent pharmacist intervention impaired efforts to convert PN to COE. Audits revealed that 60% of PN orders required some clarification. For the last quarter of 2008, 477 interventions for PN orders occurred, accounting for 24% of all pharmacist interventions. In rank order of frequency, these interventions included electrolyte changes, insulin adjustments, base formula corrections, handwriting clarification, and modification of orders for cycled PN infusions. In addition, clerical staff sometimes overlooked paper orders, thus delaying nutrition therapy. The sheer number of PN interventions raised concern about the potential for error. A Failure Mode Effects Analysis conducted by a diverse interdisciplinary panel validated many problems inherent to paper orders and underscored the need to revamp our system for ordering PN.

Objectives

To enhance safety and efficiency of PN ordering while promoting prescriber education and satisfaction.

Methods

We developed an innovative pharmacist-driven COE system that offers decision support and education to clinicians prescribing PN. To activate the system, clinicians submit an electronic “PN Request” requiring documentation of the medical condition that prevents oral or enteral feedings. Information regarding location of vascular access must also be provided (Figure 1). The system features an interactive communication tool, viewable by all clinicians, that allows the Nutrition Support Team (NST) pharmacist to post PN recommendations for review by the prescribing clinician. Recommendations reflect input from all interdisciplinary NST members and include the rationale for changes. Besides the interactive element, the communication screen displays current laboratory values and links to pertinent clinical information (Figure 2). After the prescribing clinician accepts or modifies the PN recommendations, the pharmacist submits an electronic PN order for approval/signature. All clinicians involved with PN during the trial period provided feedback about the system using a Likert scale questionnaire.

Results

The dialogue established by the interactive feature of the system promotes an exchange of pertinent information between the prescriber and the NST while educating clinicians about the intricacies of PN management. The new system circumvents the potential for transcription errors and streamlines the PN ordering process. By proactively recommending both the base formula and micronutrient content, the NST reduces clerical staff sometimes overlooked paper orders, thus delaying nutrition therapy. The sheer number of PN interventions raised concern about the potential for error. A Failure Mode Effects Analysis conducted by a diverse interdisciplinary panel validated many problems inherent to paper orders and underscored the need to revamp our system for ordering PN.

Benefits of Pharmacist-Driven Computer Order Entry for Parenteral Nutrition

- Eliminates delays in transcribing paper orders
- Abolishes verbal orders
- Confirms appropriate vascular access prior to compounding formulation
- Promotes optimal base formula and micronutrient content
- Aids in confusion related to illegible handwriting
- Eliminates orders for unstable/incompatible formulations
- Fosters more effective patient monitoring
- Prevents orders for inappropriate infusion cycles
- Enhances interdisciplinary collaboration
- Educates staff by providing rationale for PN recommendations
- Increases prescriber satisfaction

Conclusions

We implemented COE for PN ordering by developing a pharmacist-driven process that enhances interdisciplinary collaboration, promotes optimal nutrition therapy, and reduces the potential for PN prescribing errors. In addition, a decrease in PN use coincided with implementation of this project. Pharmacists, nurses, dietitians, and physicians all expressed increased high levels of satisfaction with the new COE ordering process. Data derived from this program will guide quality improvement initiatives.

References


Figure 1. PN Order Request

**Table 1. **Benefits of Pharmacist-Driven Computer Order Entry for Parenteral Nutrition

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Figure 2. PN Communication Tool

Figure 3. Adult PN Usage

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