Intravenous (IV) to Enteral (PO) Conversion of Medications Hospital Policy

PURPOSE

The purpose of this policy is to implement a program that enables our hospital pharmacists to convert IV medications to the enteral (PO or via feeding tube) route of administration when appropriate. It has been well recognized that a number of drugs are equally effective when given by either the enteral or intravenous route (when they exhibit close to 100% bio availability and are well absorbed). By converting patients to enteral medications, the risk of adverse events such as infection, thrombophlebitis, thromboembolism, and excess fluid administration can be decreased and/or avoided. Medication errors may also be avoided due to more complex preparation, dispensing, and administration procedures required for parenteral medications compared to oral medications. Converting patients to enteral therapy increases patient comfort and mobility, potentially decreases length of hospital stay, and is generally less costly than intravenous medications.

DEFINITIONS

Enteral: Refers to within, or by way of, the intestine or gastrointestinal tract, especially as distinguished from parenteral. This includes medications administered by mouth or through a feeding tube.

Parenteral: Refers to administration of a medication via the intravenous route, especially as distinguished from enteral.

POLICY

All target IV medications will be reviewed by the pharmacist for potential IV to enteral conversion upon initiation of therapy. All target IV medications are listed in Appendix A at the end of this document. Patients eligible for IV to enteral conversion will be identified by an audit of the medication administration records. If the patient is receiving an IV medication that is included on the target IV medication list, the patient's clinical status will be assessed by review of the medical record. The review will include, but may not be limited to the following inclusion and exclusion criteria:

A. Inclusion criteria
    a. Receiving target IV medication (see Appendix A)

b. Continued need for the medication
c. Functioning gastrointestinal (GI) tract without signs of malabsorption:
    i. Tolerating PO or enteral nutrition or medications for at least 24 hours
    ii. Malabsorption disorders include, but are not limited to: severe nausea, vomiting, or diarrhea; short-gut syndrome; gastro-cutaneous fistula; severe inflammatory bowel disease; bowel obstruction; ileus; and continuous nasogastric suctioning

B. Exclusion criteria
    a. Pediatric patients (< 18 years of age)
    b. Validated NPO status: no PO medication being administered, no dietary intake, or aspiration precautions ordered
    c. Scheduled procedure anticipated to require NPO status within the next 24 hours
    d. Abnormal GI absorption, GI obstruction, ileus
    e. Active GI bleeding
    f. Mental status changes affecting the ability to swallow without enteral access
    g. Documentation of unresolved exacerbation of CHF, anasarca, or ascites
    h. Additional criteria **only** for anti-seizure agents:
        i. Seizure activity within previous 24 hours
    i. Additional criteria **only** for antimicrobial agents:
        i. Severe infections (e.g., central nervous system infections, endocarditis, necrotizing pneumonia, necrotizing fasciitis, or bacteremia)
        ii. Acute febrile state (body temperature > 38˚C (100.4 ˚F)
        iii. Hypotension (SBP <100 mmHg or MAP < 60 mmHg)
        iv. Neutropenia (absolute neutrophil count <500) that is not resolving

PROTOCOL

a. Pharmacy will review a list of patients receiving targeted IV medications, generated automatically each morning
b. The pharmacist will review the list of potential IV to enteral conversion of medications and assess the patient's chart to determine if they meet the criteria for conversion as outlined in the policy above. The pharmacist should also assess for drug allergies, appropriate time of administration, drug interactions (drug-drug, drug-food, drug-procedure, etc.) and potential for adverse events. The pharmacist may involve the appropriate clinical pharmacy specialist if further consultation and/or evaluation are required. The pharmacist may also call the patient's nurse to confirm the appropriate route (by mouth or feeding tube) if unable to confirm through chart review. Patients who do not meet the inclusion criteria will be reviewed the next day unless they are

permanently ineligible for the switch (e.g., chronic malabsorption or life-threatening infection).

c. If the patient is determined to be an appropriate candidate, the pharmacist will then write an order discontinuing the IV therapy and enter the order for the specific enteral therapy “per approved protocol” in the electronic medical record. The order should include the start date and time for enteral therapy (indicating when the next dose is due, if needed), appropriate route (by mouth or feeding tube), and correct formulation depending on route of administration (liquid, tablet, or capsule).

REFERENCES

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3. Przybylski KG, Rybak MJ, Martin PR, et al. A pharmacist-initiated program of intravenous to oral antibiotic conversion. Pharmacotherapy 1997;17:271-6

4. Chan R, Hemeryck L, O'reagan M, Clancy L, Feely J. Oral versus intravenous antibiotics for community acquired lower respiratory tract infection in a general hospital: open, randomized controlled trial. BMJ 1995;310:1360-2

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6. Siegel RE, Halpern NA, Almenoff PL, et al. A prospective randomized study of inpatient IV. Antibiotics for community-acquired pneumonia. The optimal duration of therapy. *Chest* 1996;110:965-71

Appendix A

NON-ANTIMICROBIALS		
Medication	**IV Dose**	**PO Dose**
Acetaminophen‡	1000 mg IV any frequency	975 mg PO same frequency
Famotidine‡	20 mg IV any frequency	Ranitidine 150 mg PO same frequency
Folic Acid‡	Any dose IV any frequency	Same dose PO same frequency
Levetiracetam‡		
Metoclopramide‡		
Pantoprazole	40 mg IV any frequency	Esomeprazole 20 mg PO same frequency
Fosphenytoin*‡	Any dose IV any frequency	Phenytoin same dose PO same frequency
Thiamine	100 mg IV any frequency	100 mg PO same frequency

*Hold continuous tube feeds as outlined in Hospital Policy #950-106, Food-Drug Interactions, if needed

‡ Liquid formulation available

ANTIMICROBIALS		
Medication	**IV Dose**	**PO Dose**
Azithromycin‡	Any dose IV any frequency	Same dose PO same frequency
Ciprofloxacin*‡	200 mg IV any frequency	250 mg PO same frequency
	400 mg IV any frequency	500 mg PO same frequency
Doxycycline	Any dose IV any frequency	Same dose PO same frequency
Fluconazole‡		
Levofloxacin*‡		
Linezolid‡		
Metronidazole		
Rifampin		
Sulfamethoxazole/ Trimethoprim‡	Any dose (based on trimethoprim component) IV any frequency	Same dose (based on trimethoprim component) PO same frequency

*Hold continuous tube feeds for Food-Drug Interactions, if needed

‡ Liquid formulation available