

Introduction

Enteral nutrition is preferred over parenteral nutrition in patients with inadequate oral intake for an extended period of time. Enteral feeding helps preserve the functioning of the gastrointestinal (GI) tract.¹ Feeding tubes provide access to the GI tract allowing administration of medication while unable to swallow. Drug therapy is complicated by drug formulation, absorption site, first-pass elimination, as well as the size and placement of the tube.¹⁻³ Medication errors revolving around administration via enteral feeding tubes represent a need for education and implementation of hospital guidelines.

Background

In a previous evaluation of enteral medication administration in 30 patients at TJUH, it was found that 68.1% of medications given via enteral tube were ordered to be given "PO", and 22% of the medications could have been ordered in liquid formulations. As a result, pharmacists were approved to change the route of enteral administration to reflect the actual route being used. The American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.) provides recommendations for medication administration in the Enteral Nutrition Practice Recommendations. The guidelines also recommend a multidisciplinary intervention program between nurses and pharmacists to promote the most appropriate drug administration practices to reduce medication errors.^{4,5}

Compiling various pharmaceutical principles, Pharmacist's Letter has published a pharmacist's thought process in validating the appropriateness of a medication for patients as detailed below (Table 1).⁶

Table 1: Stepwise Approach to Selecting Medications for Tube Administration⁶

Step 1: Medication evaluation

- Is the medication necessary, or can it be stopped temporarily?
- Can the medication be delivered via an alternate route (e.g. intravenously, sublingually, transdermal)?
- What are the formulations available that can be used with the tube (e.g. crushable tablet, liquid or suspension)? (Table 2)

Step 2: Consideration of feeding tube selection

- Will the location of the tube affect the medication's efficacy?
 - Dobhoff tubes are small-bore tubes, and only liquid medications should be given.
 - Gastrostomy tube, NG tube, and OG tube all terminate in the stomach.
 - Jejunostomy tubes terminate in the jejunum, bypassing the stomach.

Step 3: Miscellaneous issues

- Does the medication have the potential to clog the tube?
- Does the medication have the potential to adhere to the tube?
- Does the medication interact with tube feeds? Do the feeds need to be held? If so, how long? Is this feasible?

Table 2: Formulation Consideration for Enteral Tube Medication Administration^{7,8}

Do Not Administer through Enteral Tube	Formulations to Evaluate Further
Extended-release and delayed-release Enteric coated Buccal/sublingual	Oral disintegrating tablets Liquid Formulations (Elixirs & Suspensions preferred) Hyperosmolar oral liquids (dilution required) Parenteral solutions

Figure 1: Case Scenario

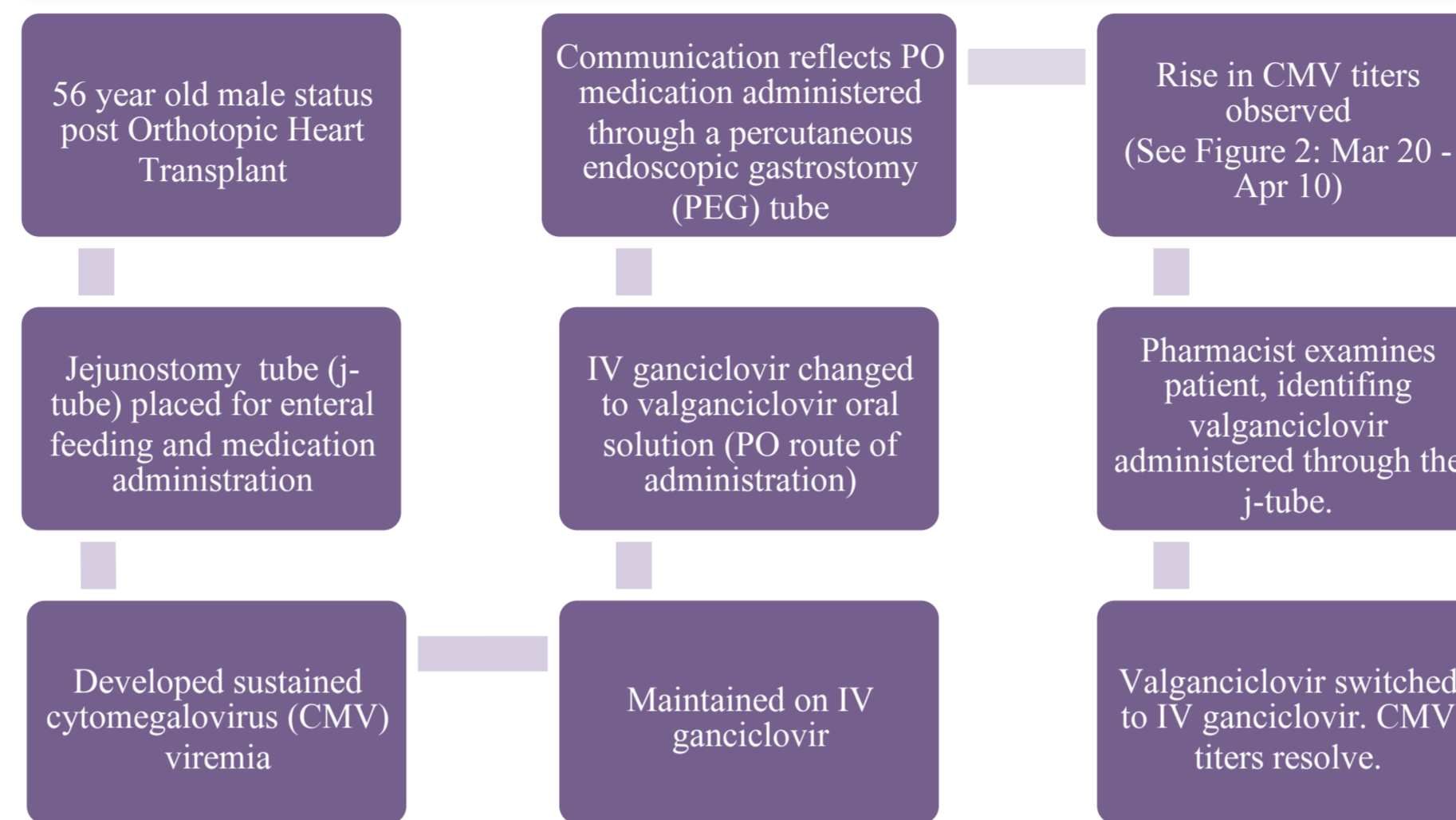


Figure 2: CMV Quantitative PCR trend over a 2 month period

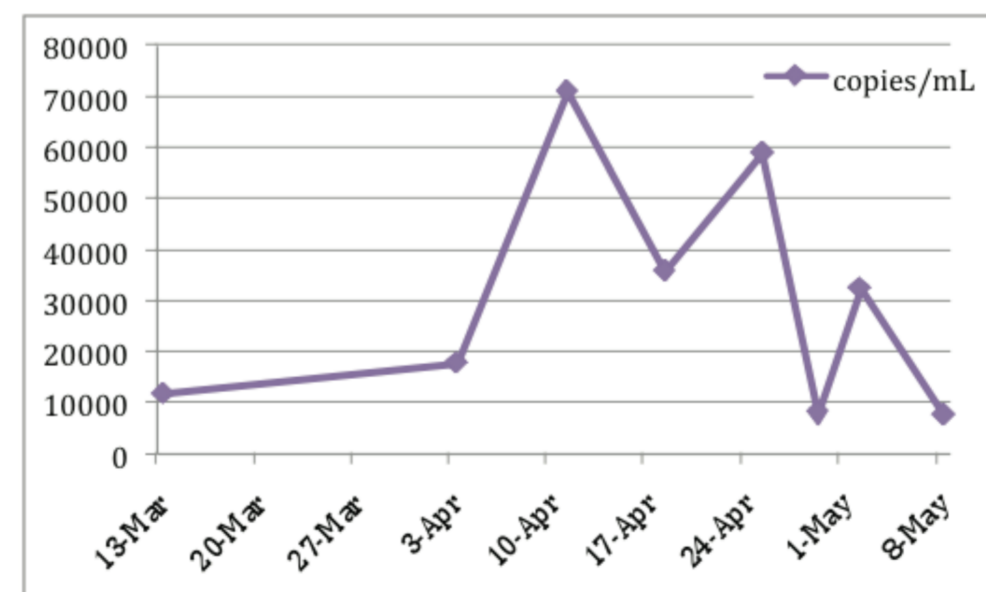
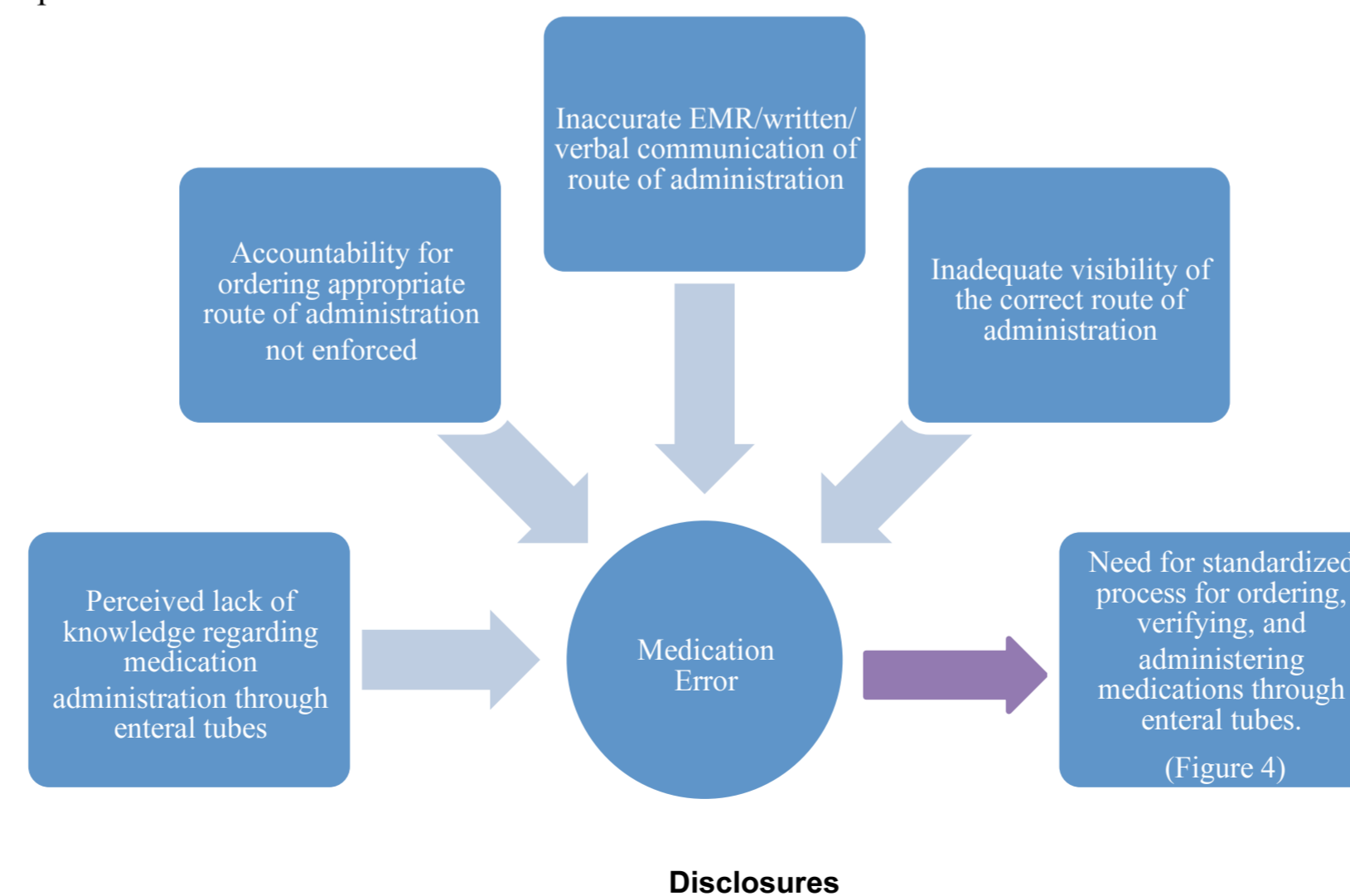


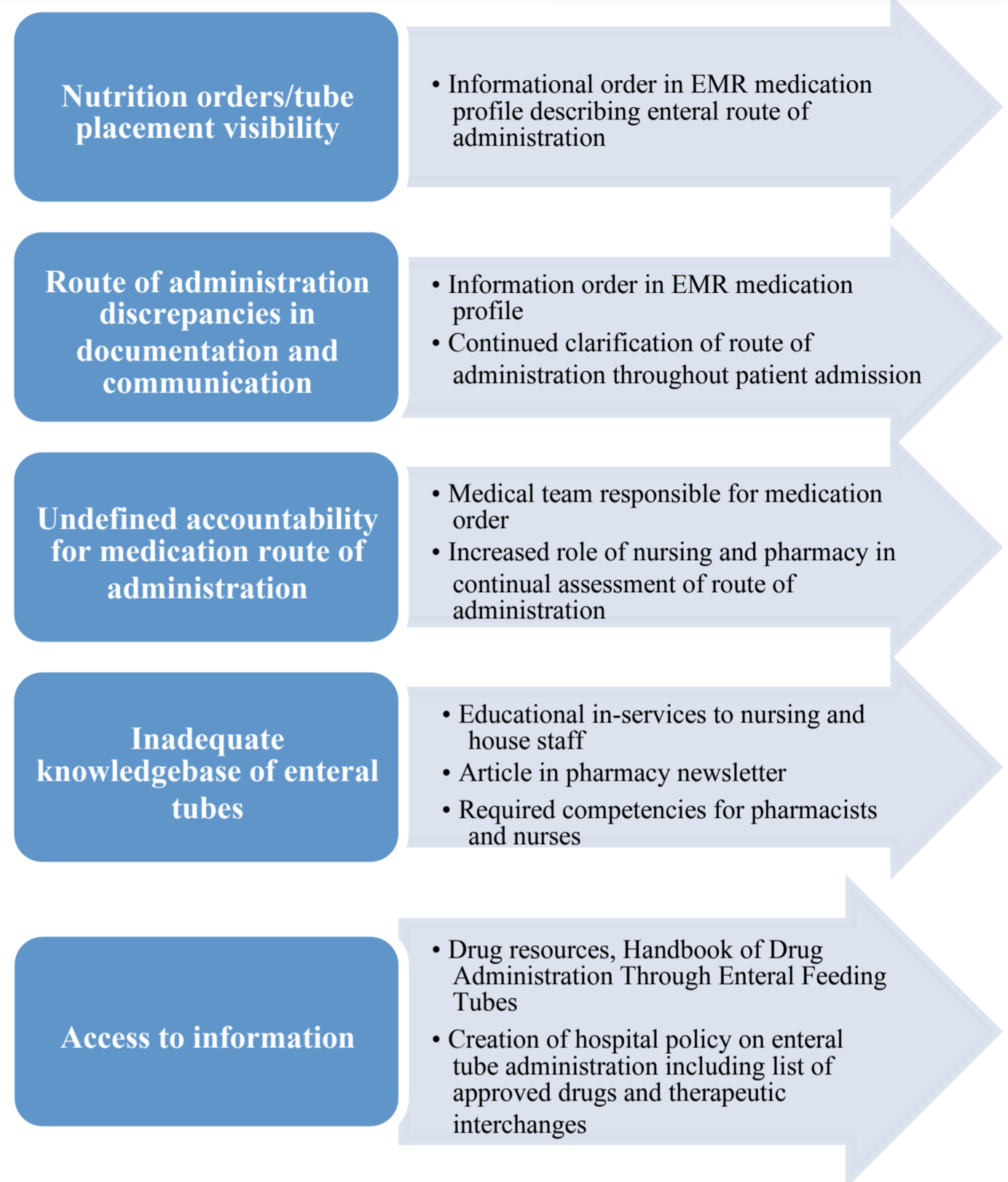
Figure 3: Evaluation and Findings

The patient case identified concerns with enteral tube medication administration.



All contributing authors have nothing to disclose concerning possible financial or personal relationships with commercial entities.

Figure 4: Strategy for Implementation



Conclusion

Ensuring the safe use of medications is the responsibility of all members of the healthcare team. Patients receiving enteral feeding pose a unique challenge, which can be circumvented through building knowledge and providing standardized procedures. TJUH has identified weaknesses in current practice and has developed a plan to work to strengthen those areas. As medication experts, pharmacists are in a prime position to provide education and support in choosing the correct medications and formulations. TJUH will continue to implement and evaluate changes to the medication use process ensuring all patients appropriately receive necessary medications.

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