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LifelineLetter

Living with home parenteral and/or enteral nutrition (HPEN)

Drug Administration through a Feeding Tube

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Administering medications through a feeding tube is more than just a daily task to perform; it is part of the entire drug-use process and can influence health outcome. Whenever possible, the methods and techniques used should be best practice as based on evidence.

According to many surveys, the techniques used to prepare and administer drugs through feeding tubes are often inappropriate. Some of the most common inappropriate techniques identified are listed in Table 1 (next page). These increase the risk of rendering a drug less effective, or conversely more toxic, or promote clogging of the feeding tube.

Understanding Oral Medications

Oral medications, whether prescribed or purchased over-the-counter, are made to be taken by mouth. The physical and chemical properties of each drug are carefully considered and accounted for when the dosage forms (either solid, like tablets and capsules, or liquid, like solutions or suspensions) are designed and evaluated. A specific dosage form is chosen to ensure that the active drug ingredients are absorbed.

The manufacturers and the Food and Drug Administration (FDA) rarely investigate or approve a drug to be administered specifically through a feeding tube. This means any change to the construction of a dosage form (for example, crushing a tablet) or diluting its contents in food or fluids will alter the design as intended by the manufacturer and approved by the FDA. It will affect how the drug is released. Yet in order to administer these oral medications through a feeding tube, it is necessary to alter their form. It is important that you consider how your medications are designed (liquid or solid; immediate-release, modified-release, or extended-release) in order to understand how they can best be administered.

Dosage forms contain the active drug molecules along with several other ingredients that determine how the drug will be absorbed. Solid dosage forms (tablets or capsules) can allow the drug to be released immediately after it dissolves in the stomach (i.e., "immediate-release") or allow the drug release to be modified (i.e., "delayed-" or "extended-release"). Liquid dosage forms are usually immediate-release.

Modifying Dosage Forms: How, When, and Why

The American Society for Parenteral and Enteral

Nutrition (A.S.P.E.N.) recently published *Enteral Nutrition Practice Recommendations*, which includes a section on medication administration. This was followed by a "Medication Safety Alert" issued by the Institute for Safe Medication Practices (ISMP) for preventing errors when administering drugs through a feeding tube. The major recommendations are provided in Table 2 (next page). A brief explanation of the rationale behind the recommendations follows.

Do not add medications to the enteral nutrition formula. A medication should only be added to an enteral nutrition formula if there is adequate data on the compatibility of the mixture and the stability of each component. Such data would assure that the drug (and nutrients) is still absorbed as expected.

Use only immediate-release dosage forms.

Enteric-coated tablets or capsule contents are considered a modified-release product. If these are compromised by crushing, the drug will be susceptible to destruction by stomach acid before it has the chance to be absorbed. Also, the enteric coating can get sticky when combined with water, the tablet may not fully disintegrate, or the product may form clumps, all of which can result in tube obstruction.

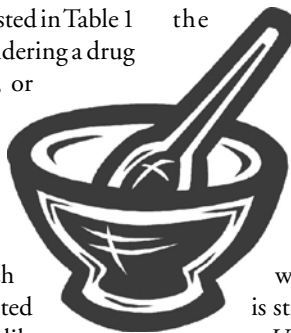
Extended- (aka sustained-) release tablets or capsules are intended to deliver a large dose slowly over many hours. Crushing these will make a potentially toxic dose available all at once.

Other drugs can pose a risk to the care provider if crushed in an open vessel. Place these medications inside a syringe and dissolve prior to administration. Use caution when mixing to avoid breathing the dust and skin exposure.

[Editor's note: See the "Do Not Crush" list from the Institute for Safe Medication Practices (Web site is listed on the next page) and discuss with pharmacist and/or health care provider as necessary.]

Administer each medication separately. Each drug appropriate for administration through the tube should be administered separately to reduce the chance of tube clogging and drug interaction. There is a greater potential for drugs to interact with each other when pulverized into a powder and/or mixed in a fluid.

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Drug Administration, from pg. 1

Dilute the medication before administration. This is very important, especially if the liquid is a suspension. Diluting powdered or liquid medication with water improves the chances of drug delivery to the end of the tube. Dilution of liquid medication with water can also reduce the risk for gastrointestinal discomfort, particularly for tubes into the duodenum or jejunum. Solubilizers and other ingredients can irritate the gut and cause fluid secretion and/or cramping.

Flush the feeding tube before and after each medication. Flushing between medications also limits the potential for interaction and tube clogging. The volume of water should be at least 30 mL unless instructed otherwise.

It is important to administer medications the same way every time and to space the interval from eating consistently to avoid the influence of food on the drug's absorption.

Use oral/enteral syringes to measure, prepare, and administer medications. Use of syringes and tubing intended for IV injection opens the possibility that a feeding-tube drug or nutrition be given by mistake as an injection.

Consult with a pharmacist. Your pharmacist should be able to tell you of possible drug interactions.

As with all guidelines, there are exceptions. Proton pump inhibitors (PPIs), for example, are enteric-coated, but are sometimes administered through feeding tubes (this should be done with extreme caution in preparation and administration). Some dissolve better than others. (In April, the FDA issued a notice that they had received reports of clogged tubes with the use of delayed-release oral lansoprazole tablets manufactured by Teva Pharmaceuticals.) In some cases, the guidelines are issued because of the potential for problems. There are some medications, for example, that can be safely combined, such as immediate-release multi-vitamin products.

The preparation and administration of medications through a feeding tube using these recommendations, however, will help assure appropriate drug use and limit the chances of unwanted outcomes. ¶

LifelineLetter

September/October 2011 • Volume XXXII, No. 5

Publisher:

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The *LifelineLetter* is sent free of charge to those on home parenteral or enteral nutrition. There is no charge for others as well if they receive the newsletter electronically.

The *LifelineLetter* is the bi-monthly newsletter of the Oley Foundation. Items published are provided as an open forum for the homePEN community and should not imply endorsement by the Oley Foundation. All items/ads/suggestions should be discussed with your health care provider prior to actual use. Correspondence can be sent to the Editor at the address above.

Table 1. Common Errors in Medication Preparation and Administration

- Not flushing the tube before administering the medication
- Administering multiple medications mixed together
- Not flushing the tube between each medication
- Crushing modified-release tablets
- Not diluting liquid medication before administration

Table 2. Some Practice Recommendations for Medication Administration

- Do not add medications to the enteral nutrition formula
- Use only immediate-release dosage forms
- Administer each medication separately
- Dilute the medication before administration
- Flush the feeding tube before and after each medication
- Use oral/enteral syringes to measure/prepare/administer medications
- Consult with a pharmacist

Additional resources:

Oral Dosage Forms That Should Not Be Crushed ("Do Not Crush" list):

www.ismp.org/Tools/DoNotCrush.pdf

A.S.P.E.N.'s Practice Recommendations:

nutritioncare.org/Professional_Resources/Guidelines_and_Standards/Guidelines/2009_ENPR_-_Section_VII_Medication_Administration/

FDA Dissolution Methods:

www.accessdata.fda.gov/scripts/cder/dissolution/dsp_SearchDissolution.cfm?nr=y