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The Role of a Home Health Care Pharmacist—Medication Management for Patients with Feeding Tubes

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Abstract

Home health care is a method of medical care that patients receive inside their home under the supervision of a collaborative team of physicians, nurses, pharmacists and sometimes other health care professionals. Home health provides patients with the same standard of care that they would be receiving in a nursing home or hospital. However, the treatment and continued monitoring at home reduces health care costs and makes the patient feel more comfortable. Pharmacists analyze, resolve and prevent medication-related problems in home health care in order to minimize hospitalizations and improve patient quality of life. Pharmacist involvement with other health care professionals in the patient transition of care can help maximize the quality of patient care. To become a home health care pharmacist, neither a residency nor certification is required. Home health pharmacists perform medication reconciliation, comprehensive medication reviews, monitor intravenous drug therapy and enteral therapy, identify high-risk medications and adverse drug reactions, prevent polypharmacy and improve patient adherence. Patients that must be fed through enteral nutrition tubes in the home health care setting have a set of special concerns that the home health care team must address. Pharmacists' extensive knowledge of medication necessitates their involvement on the home health care team.

Key Terms

Enteral Nutrition; Home Health Care; Patient Care Team; Pharmacist; Health Care Costs

Role of the Home Health Care Pharmacist

Patients receiving home health care frequently rely on their personal financial assets, such as their ability to afford medications and personal health aid, as well as their level of health literacy to manage their medications and health. This unstructured environment may lead to undesirable medication problems which may interfere with the goals of therapy. One of home health care's biggest roles is to prevent the use of unnecessary and duplicate medications or the omission of proper drugs. In addition, patients may be using inappropriate doses and possibly experiencing drug-drug interactions. Each of these issues provides an opportunity for the home health care pharmacist to assist in patient care. Currently, neither a residency nor certification is required for this specialty. In the home health care environment pharmacists perform medication reconciliation to identify and prevent complications. These complications could be due to drug-drug interactions or unnecessary medications which can be identified by comparing a patient's medical records to hospital admissions, transitions of care and discharge orders.

Typically, a home health pharmacist may visit or interact with at least five patients each day for about 30 to 60 minutes. The patient-pharmacist meeting may be conducted in several ways including telephone interviews, home health visits, chart reviews or a combination of each. Prior to the appointment, the home health pharmacist examines the patient's information and performs a comprehensive medication review to include all prescriptions, over-the-counter medications and any dietary or herbal supplements. During the appointment, the pharmacist and patient discuss the appropriate indications for current medications as well as the safety and efficacy of these medications. The pharmacist also assesses the patient's adherence and compliance to the suggested therapeutic plan. The pharmacist is required to properly document all of the current medications, health conditions and medication-related problems discussed with patients during these meetings. The patient-pharmacist meeting provides a great opportunity for pharmacists to be personally involved with their patients and allows them to detect any issues earlier and more readily.

According to an abstract from a study done by Lipton et al., out of 236 ambulatory care patients that were 65 years of age and above, 88 percent presented with at least one clinically significant medication problem. This is an opportunity for pharmacists to encourage and aid other health care workers in employing evidence-based prescribing for all patients, with special consideration for those at home. As a result, the number of medication problems can decline to hopefully decrease overall patient mortality and medical costs. Additionally, pharmacists can aid in the adjustment of medication regimens and treatment to patient's learning ability, which is especially important for those receiving home care at home. This involves assessing a patient's reading level, ability to comply with medication regimens and understanding of medication administration and safety, all of which can be done by a home health care pharmacist.

Home Health Pharmacist Assistance in Transitions of Care

According to Hester et al., almost two-thirds of medication errors happen during transitions of care into the home health setting, and approximately one in five older patients are readmitted within one month after hospital discharge due to a preventable medication error. Common medication classes that cause these readmissions include anti-infective, cardiovascular, central nervous system, endocrine and hematologic medications, with the most problematic medications being oral antplatelets, oral hypoglycemics, insulin and warfarin. Starting in 2012, these preventable hospital readmissions are being monitored by the Centers for Medicare and
Medicaid Services (CMS), which monetarily penalizes hospitals for high readmission rates.

One way to improve the transition of care is for pharmacists to continually perform medication reconciliations, during which they analyze the patient's medications to avoid drug interactions, duplicative therapies or indication errors. Improving the communication between home health, community and hospital-based pharmacists can also help clarify questions and identify medication discrepancies. Additionally, pharmacists in all settings can aid in the transition of care by keeping an open line of communication with the physicians and nurses that are treating the patient.

**Enteral Nutrition**

Enteral nutrition (EN) is utilized to improve quality of life through the prevention and treatment of malnutrition and improve growth in children, while also aiding in the treatment of chronic gastrointestinal disease states such as Crohn's disease. Several chronic disease states such as dementia, cystic fibrosis, peritoneal dialysis, oro-pharyngeal and esophageal malignancy and amyotrophic lateral sclerosis (ALS) can also benefit from home-health monitoring. Diseases such as Crohn's disease, pancreatitis and ulcerative colitis may require patients to be put on feeding tubes for nutritional support.

Feeding tubes assist patients by retaining hydration (decreasing the possibility of aspiration or choking), managing weight as well as preserving energy. For patients with a functioning gastrointestinal (GI) tract, EN is preferred over total parenteral nutrition (TPN). In contrast to TPN which is administered intravenously, EN utilizes a feeding tube directly placed in the GI tract. As a result, the overall risk of infection is decreased, providing better patient outcomes.

Enteral nutrition involves the administration of a formulated liquid, also known as medical food, to help the distinct dietary needs for a patient's particular disease state or condition. These formulations contain fats, carbohydrates, vitamins, proteins and minerals to exceed 1,350 kilocalories a day. Enteral nutrition should be considered when nutrition and hydration are insufficient, dysphagia and aspiration occur frequently or weakness and weight loss lead to decreased energy. Contraindications to EN use include active coagulopathies, thrombocytopenia, sepsis, peritonitis, ascites, anorexia and pyloric obstruction. Part of the pharmacist's role in patients with feeding tubes is to ensure that the patient's daily nutritional needs are met and successfully coincide with their medication needs without interactions.

Although EN provides great benefits for patients, some may fear having a surgical procedure to implant the tube or the possibility of infection or pain at the insertion site. Before a patient is placed on EN, a health care professional must ensure that the patient and their caregivers are capable of implementing this therapy. Ongoing medical supervision is necessary for those receiving EN products in order to avoid complications. This supervision includes the assessment of patient motivation, financial status, educational ability, nutritional and medical benefit, physical limitations and capacity to adhere to safety standards. This is an area in which home health pharmacists are needed to maintain an open flow of communication between health care members, as well as to properly educate patients on EN administration, how to administer medications while utilizing a feeding tube and common complications that may arise with both EN feedings and medication administration through the tubes.

**Enteral Feeding Tube Selection and Administration**

There are many important considerations when a patient is enterally fed. The type of feeding tube to be used is determined by the patient's disease state and the severity of their condition as well as the length of time that they will need to receive tube feeding. Nasoenteric tubes are most often used for short-term (one to three weeks) nutritional support due to their low cost and easy insertion through the nose directly into the GI tract. These include nasogastric (NG) and nasoduodenal (ND) as well as nasojejunal (NJ) tubes. Orogastric (OG) tubes are also used for short-term feeding and are inserted through the mouth into the stomach. Orogastric tubes are used for short-term feeding when the tube cannot properly be placed nasally due to injury, deviated septum or sinusitis. For long-term (four to six weeks or more) tube feeding, the tubes are surgically placed directly from the outside of the body into the stomach or intestine, bypassing the upper part of the GI tract. The most commonly used tube is the percutaneous endoscopic gastrostomy (PEG)-tube because of its relatively easy method of placement.

Nutrition support via enteral feeding can be provided in different ways depending on the type of tube and patient's condition. Feedings can be continuous, cyclic, bolus or intermittent. Continuous feeding over a 24-hour period is the preferred method for the initiation of EN therapy in critically ill patients due to the constant administration of nutrients. However, continuous feedings are commonly interrupted when patients need to take their medication. Cyclic feedings are a continuous supply of nutrients over a period of eight to 20 hour period and typically take place throughout the night when the patient is sleeping. Bolus feedings occur four to six times per day to allow the nutrients to be absorbed. Continuous nutrition support via enteral feeding is needed. In this circumstance, EN should be stopped 30 minutes before giving the medications to allow gastric emptying. Then, EN may be started 30 minutes after the medication is given which allows time for absorption. Intermittent feeding is similar to bolus feeding but used over a longer duration. Continuous and cyclic feedings are preferred when feeding is needed in the stomach or small intestine, whereas bolus and intermittent feedings are generally used only in the stomach and not in the small intestine. Feeding tubes sizes are typically small-bore (5 to 12 French units) or large-bore (14 or more French units) where 1 French unit is equivalent to 0.37 mm. Both small and large bore tubes are used for percutaneous routes into the stomach and small intestine. In contrast, smaller bore tubes are more commonly used for nasogastric routes and larger tubes for oral routes. Smaller tubes are generally more comfortable than larger tubes. However, they become clogged more easily by thick nutrition formulations or medications administered through the tube.
It is very important to avoid tube occlusions, or blockages, because they prevent the patient from receiving their proper nutrients and medications. Regardless of the dosage form used, the tube needs to be flushed with about 30 mL of sterile water before and after medication administration to help prevent occlusions. In addition to flushing and irrigation, patients may be given a prophylactic dose of alkalized enzyme solution with a pH of 7.9 to prevent occlusion. This solution typically consists of one crushed pancrelipase tablet (lipase 8,000 units, amylase 30,000 units, protease 30,000 units) mixed with one crushed sodium bicarbonate tablet (324 mg) which is then dissolved in 5 mL of warm water. The administration of alkalized enzyme solution may also be used to try to unclog an occluded tube.

Medication Considerations for Patients on Feeding Tubes

Patients receiving feeding tube nutrition require special considerations for the administration of medications due to the underlying disease state inhibiting the patients’ ability to take drugs orally. Drug absorption for patients on EN is affected by the dosage form of the medication as well as the placement of the feeding tube. For instance, some oral medications can be crushed and given through feeding tubes, conveniently depositing the medication directly into the patient’s GI tract. However, some oral medications may not be crushed for administration due to their coatings because the medication will not have extended release properties and, therefore, it will not absorb correctly (i.e., acetaminophen, ferrous sulfate, omeprazole). Nonetheless, liquid formulations of some of these medications are available, solving this issue. Possible interactions may also exist between the drug and the compounds in the nutrition regimen (i.e., phenytoin, carbamazepine, warfarin). Delayed and extended release tablet coatings may not be crushed due to their release characteristics; if the coating is broken, the drug will not be administered the way in which it was intended. Instead, all of the drug would be released/absorbed at once rather than delayed or extended over time. In addition to the properties of the drug itself, it is also important to make sure that the drug formulation is able to physically pass through the tube and into the GI tract without causing an occlusion or damaging the tube. If any of these interactions or occlusions occur, the patient will not receive the proper dose of the drug.

In addition to solid dosage forms, several other oral dosage forms may be administered through the EN tube. Liquid preparations are preferred because they are readily absorbed, do not have to be crushed, and are less likely to cause tube occlusions. Suspensions and elixirs are preferred over syrups because of their decreased viscosity. The toxicity, osmolality and sorbitol content of liquid preparations should be closely monitored to prevent adverse events such as diarrhea, bloating, nausea or cramping. Solutions may be diluted with sterile water if necessary. Liquid-filled capsules are also able to be administered enterally, and in most cases the capsule may be dissolved and all contents can be put through the tube. Capsules that contain beads or powders may be broken so that only the beads or powders may pass through the EN tube.

When considering drug absorption issues due to the placement of the feeding tube, the pharmacist has to examine the pharmacokinetics of the particular medication. Most medications are typically absorbed in the small intestine, but some drugs such as antacids, sucralfate and bismuth have actions in the stomach. If a patient has a feeding tube placed in the small intestine but needs a drug that acts in the stomach, the administration of the drug through the intestinal feeding tube will have minimal effects. Another example of this involves ketoconazole and itraconazole. In order for these medications to be properly absorbed, they must interact with the acidic gastric environment. However, if the feeding tube is in the small intestine, these drugs will have decreased bioavailability due to the absence of interaction with the stomach environment. Another consideration should be taken into account for drugs such as opioids, tricyclic antidepressants, beta-blockers and nitrates that undergo extensive first-pass hepatic metabolism. If these drugs are administered through a feeding tube that deposits into the jejunum, their absorption will increase leading to greater systemic effects. It is extremely important for pharmacists to check drug compatibility with the placement of the tube for home health patients to avoid changes in drug absorption/bioavailability.

Medications generally should not be coadministered with the nutrition formulation, with the exception of any necessary electrolyte supplements. Combining the medication with the nutrition formulation will increase the probability for a drug-nutrient interaction, alteration of the bioavailability of the medication, occurrence of tube occlusions and potential microbial contamination. Pharmacists should be knowledgeable of possible drug-nutrient interactions causing reduced medication bioavailability.

For example, the effectiveness of antimicrobials such as levofloxacin, ciprofloxacin and moxifloxacin can be decreased by calcium, magnesium and iron during tube feeding. Also, enteral feeding should be held one to two hours before and after the administration of either phenytoin or warfarin to avoid decreased bioavailability of these medications caused by binding to the protein component of the medical food. Although medical food formulations are compatible with some medications, it is necessary to check package inserts or drug information sources to ensure the safety of concurrent administration of a medication with EN.

Patients with enteral feeding needs that are on medications present a very important area of concern for the home health pharmacist—the drug expert of the home health team. Each medication the patient is taking should be evaluated by the pharmacist to determine how it needs to be administered, if there are any absorption issues due to the EN and if there are any possible interactions between the medications and nutrition regimen. A comprehensive list of medications that cannot be crushed is available from the Institute for the Safe Use of Medications at www.ismp.org/tools/donotcrush.pdf. Additionally, pharmacists can refer to the package insert of specific medications using drug information sources such as Clinical Pharmacology, Lexicomp®, Micromedex® or Facts & Comparisons®. Alternative routes of administration, such as...
intravenous infusions and intramuscular injections as well as transdermal patches and sprays, must be considered for medications that cannot be given through the tube. In these instances, pharmacists may also consider finding a different, therapeutically equivalent medication that can be administered through an enteral tube.

Conclusion
The growing use of EN in home health requires home health pharmacists to become more involved in patient care. On the home health care team, physicians are responsible for prescribing medications, while nurses are responsible for administering them to the patients. Pharmacists, as drug experts, are able to maximize medication therapies for EN patients through ensuring that medications are administered in the proper dosage form, and that there is little to no risk of drug interactions. In order to have the best outcomes for home health EN patients, pharmacists must work with other health care providers to decrease medication-related errors, reduce feeding tube complications and provide a better quality of life for each patient.

References

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