alixaRx

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From the Front Lines

AlixaRx Clinical Pharmacists Address Everyday Challenges in Long-Term Care

Medication-Induced Hypothyroidism

Many of our residents require thyroid hormone supplementation due to an underactive thyroid gland. Hypothyroidism is more common in women and has an overall total prevalence of 1-2%. This prevalence increases with age to almost 10% in patients over 65. More than 12% of the US population will develop a thyroid condition during their lifetime. But did you know that some medications can cause hypothyroidism? Drug induced hypothyroidism is characterized by an underactive thyroid gland due to a reaction from a medication. There are several medications that can cause hypothyroidism.

As we know, medications used to treat an overactive thyroid gland (hyperthyroidism) inhibit production of thyroid hormones. These medications include propylthiouracil and methimazole. When given in higher doses, these medications may suppress production of thyroid hormone to the degree that the patient will not produce enough thyroid hormone to maintain therapeutic levels. Dosage adjustment will usually resolve the hypothyroidism. Additionally, a high dietary intake of iodine may cause suppression of thyroid hormone production.

In this issue:

Amiodarone can cause both hyper- and hypothyroidism. Hypothyroidism has been reported in about 2-10% of patients receiving amiodarone. Hyperthyroidism can also occur in approximately 2% of patients receiving amiodarone – mostly due to the high iodine content of amiodarone. There appears to be no correlation between the dose of Amiodarone or duration of therapy and the development of thyroid conditions, however most cases develop within the first 2 years of therapy. Thyroid function should be tested before starting therapy and 3-4 months after starting therapy. Routine periodic monitoring is recommended. Symptoms of hypothyroidism may be masked due to amiodarone's action on the heart. The half-life of amiodarone is about 40-55 days, so discontinuation of therapy will not produce any immediate effects on symptoms.

Lithium has multiple effects on thyroid hormone production and secretion. Hypothyroidism has been reported in 5-20% of patients taking lithium carbonate. It is more commonly seen in patients taking lithium for more than 2 years. Once lithium is stopped, the hypothyroidism does not always resolve, and life-long levothyroxine therapy may be necessary.

Interferon alpha may cause inflammation of the thyroid gland, which can lead to hypothyroidism. The prevalence of thyroid abnormalities during therapy ranges from 2.5-20%. Symptoms may occur as early as 6 weeks after starting therapy or may be delayed until after up to 23 months of therapy. The thyroid abnormalities associated with

interferon treatment are often transient, not requiring treatment. Thyroid hormone supplementation may be used to alleviate symptoms. Hypothyroidism usually resolves spontaneously within 2-3 months of stopping therapy. Medications that induce the Cytochrome P450 hepatic enzymes, such as phenytoin, carbamazepine, phenobarbital and rifampin, can increase the metabolism of thyroid hormones by up to 20%. In patients with normal thyroid function, this is not clinically significant. However, patients who already require thyroid hormone supplementation may need higher levothyroxine doses to maintain normal levels.

Tyrosine Kinase Inhibitors, such as sunitinib (Sutent) and sorafenib (Nexavar) have also been associated with causing thyroid dysfunction. Little is understood about the mechanism of how these medications cause hypothyroidism, nor are there any clear established guidelines on how to treat it. Increased monitoring for symptoms and routine monitoring of thyroid function tests are recommended.

It is important to monitor our residents on any of these medications for signs and symptoms of hypothyroidism, which include brittle fingernails, coarsening and thinning of hair, cold intolerance, depression, constipation, dry skin, fatigue, puffy eyes, weakness and weight gain. Routine monitoring of thyroid function is recommended to check for drug-induced thyroid abnormalities.

References: 1. Dong, Betty J. How Medications Affect Thyroid Dysfunction. West J Med. 2000; 172(2): 102-106. 2. Ahmadieh, Hala and Salti, Ibrahim. Tyrosine Kinase Inhibitos Induced Thyroid Dysfunction: A Review of its Incidence, Pathophysiology, Clinical Relevance and Treatment. Biomed Res Int. Published Online 2013 Oct 27 10.1155/2013/725410. 3. Skugor, Mario. Hypothyroidism and Hyperthyroidism. Cleveland Clinic Center for Continuing Education. Published August 2014. Accessed at www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/endocrinology/hypothyroidism-and-hyperthyroidism/ 4. General information/press room of the American Thyroid Association. Accessed at http://www.thyroid.org/media-main/about-hypothyroidism/ A.D.A.M. medical encyclopedia. 5. Hypothyroidism. Accessed at https://www.nlm.nih.gov/medlineplus/ency/article/000353.htm

F431: Accountability for Liquid Controlled Medications

Regulations require that long-term care facilities have a system to account for the receipt, usage, disposition and reconciliation of all controlled medications.

In September 2015, CMS issued a draft memo (100-07) providing clarification to guidance at F431 regarding liquid controlled medications:

> *"Liquid controlled medications are often dispensed in multi-dose containers to indicate approximate volume. The containers may also be opaque to protect the medication from light. Surveyors should be aware that absolute accuracy in tracking volume and use of liquid controlled medications may not be possible. The actual volume in these containers may be slightly over or under the manufacturer's stated volume depending on the shape and material of the container and the formulation of the medication such as thick liquid suspensions.*
>
> *The general standard of practice for documenting usage of liquid controlled medications is to record the dose administered and estimate the remaining amount. The opaque container, measurement markings, manufacturer fill volume variation, and method for recording usage all make detection of diversion for liquid controlled medications more difficult. Manufacturer's instructions may list the estimated volume variance (e.g., 30 mL plus or minus 2.5 mL).*
>
> *For liquid controlled medications, signs of diversion may include: a significant discrepancy between the written balance of remaining medication compared to the remaining amount in the bottle upon visual inspection; changes in the viscosity or color of the medication; reports of spills; and, as with other controlled medications, statements from a resident that the medication is not working."*

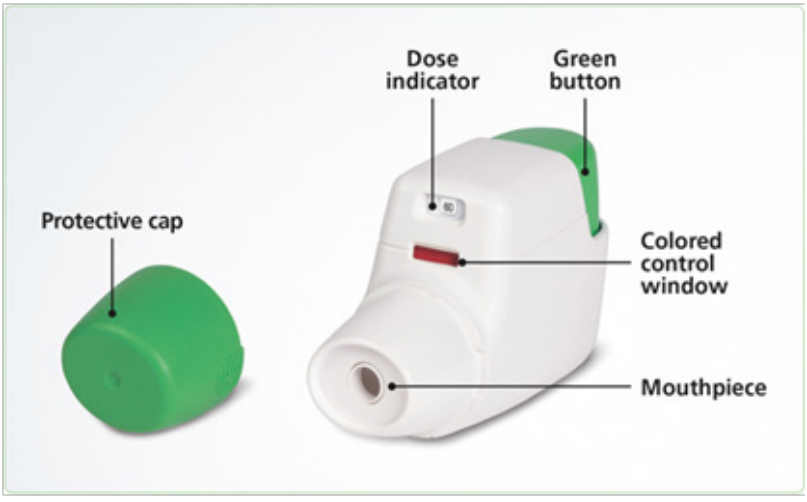
The consulting pharmacist is not required by these regulations to perform the reconciliation, but rather is required to evaluate and determine if the facility maintains an account of all controlled medications. The reconciliation should be performed according to the facility's procedures, and must be consistent with state and federal requirements.

Of significant concern to nursing staff are clear liquid controlled medications including morphine concentrated solution 20mg/ml. To address this issue, the AlixaRx pharmacies are in the process of obtaining these products

in colored solutions whenever possible. This should improve the accuracy of reconciliation during administration to the patient and at shift change.

Your AlixaRx Clinical Pharmacist (ACP) can assist your facility to meet this requirement by conducting periodic audits of controlled drug receipt, storage, disposal and reconciliation of controlled drugs with a focus on liquid medications as described above. Your ACP can also assure that systems are in place to prevent and detect diversion of these medications in a timely manner.

Nursing Update on New COPD Inhaler Devices - Part 3 Pressair® Inhalers



The Pressair® inhaler device contains the medication aclidinium bromide (Tudorza®), an anticholinergic medication for the treatment of chronic obstructive pulmonary disease (COPD). It is recommended to be administered by inhalation twice daily.

Administration:

1. Remove the protective cap.
2. Press the green button all the way down and release getting a dose ready (do not inhale at this time).
3. Check the control window. If it is green the dose is ready, if it is red repeat step 2.
4. Instruct the resident to breathe out and place lips on the mouthpiece, then to breathe in quickly until you hear a “click” sound. The dose is not fully administered if you do not here a click. Do not hold or press the green button during inhalation.
5. Tell the resident to hold their breath for as long as possible, breathing slowly out through their nose when finished.
6. Check the control window again and ensure it has turned red (this is the clicking sound you heard during inhalation). If the window is green repeat steps 4 and 5 again. If the resident cannot inhale properly, communicate to their physician or your AlixaRx Clinical Pharmacist for alternatives.
7. Place the protective cap back on the inhaler and store in the medication cart.

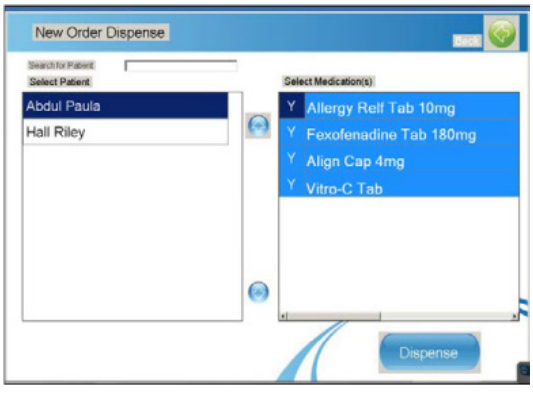
Storage and Labeling: Store the inhaler at room temperature in packaging provided from the pharmacy. Write the date opened and discard date on the inhaler label. The discard or expiration date is 45 days from the date the sealed pouch was opened. Discard the Pressair® inhaler after 45 days, when the dose indicator reads zero, or when the inhaler locks out and the green button can no longer be depressed, whichever comes first.

References: http://www.tudorza.com

ADU Optimization

The Automated Dispensing Unit (ADU) is periodically optimized to better serve the residents at your living center. Infrequently used medications may be replaced with those currently being sent in bubble packs. Your Pharmacy Service Technician (PST) and AlixaRx Clinical Pharmacist (ACP) can help determine when your facility is scheduled for an optimization. After the optimization is complete there will be several "New" medications in the ADU ready to be dispensed for residents that still have the same medication in a bubble pack supply. IMPORTANT: After an optimization do not dispense "New" medications from the ADU until the current bubble pack supply has been used. Following this procedure will reduce medication waste, saving time and money.

These "New" medications are able to be dispensed under the "New" button on your AlixaRx ADU kiosk. After selecting "New" then select your resident and the medications you would like to dispense. A "Y" displays next to the medications that are selected to be dispensed. Please make sure you have used up the current supply of bubble pack medications before completing this step. Once you have dispensed the "New" medications from the ADU they will continue to be dispensed as scheduled with the other routine medications. Failing to follow this step, will result in increased medication waste if there is still bubble pack supply on-hand.



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