Vitamin D Deficiency and the Risk of Falls

It is estimated that falls occur in 30% of those 65 years of age or older and 40-50% of those 80 years or older. The risk of falls and fractures in the elderly is increased by many different factors including visual impairment, neurological disorders, orthopedic disabilities, drug side effects, and muscle weakness.

Vitamin D is important for more than bone health. Recent evidence has shown that vitamin D may improve muscle strength and prevent falls. Poor muscle strength and muscle weakness may be associated with vitamin D deficiency, which is common in the elderly due to decreased capacity of the skin to synthesize the pro-vitamin calcidiol (25-hydroxycholecalciferol). Serious vitamin D deficiency is common in homebound and nursing home residents. Higher concentrations of calcidiol are associated with increased muscle strength, physical activity, and the ability to climb stairs while low concentrations are associated with falls among the elderly. The physiologic explanation for the beneficial effects of vitamin D on the risk of falls is that the active vitamin D metabolite binds to a specific receptor in muscle tissue, leading to improved muscle function which leads to a decreased risk of falls.

A meta-analysis published in JAMA concluded that vitamin D supplementation appears to decrease the risk of falls among the elderly by more than 20%. This meta-analysis concluded that 15 patients would need to be treated with vitamin D to prevent one person from falling.

A dose of at least 800 IU daily is required to help prevent falls. Some physicians prescribe vitamin D 50,000 IU once monthly but this dose has not been studied for fall prevention. The Institute of Medicine has determined the tolerable upper intake for vitamin D to be 2000 IU daily, although larger doses given for a short period of time (such as 50,000 IU of D2 given weekly for 6-8 weeks for replenishment in deficient patients) are acceptable. Most studies suggest that vitamin D3 (cholecalciferol) is superior at increasing and maintaining vitamin D levels. It is important to remember that administration of cholecalciferol is ineffective in patients with renal or hepatic failure because the kidney is responsible for the first step of vita-

continued on page 3......
<table>
<thead>
<tr>
<th>Medication</th>
<th>Food/Drug Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoroquinolones: Ciprofloxacin (Cipro), Levofloxacin (Levaquin), Moxifloxacin (Avelox), Gatifloxacin (Tequin), Ofloxacin (Floxin), etc.</td>
<td>Take 30 minutes prior to eating or two hours after eating. Avoid taking with antacids, milk, dairy products or iron-containing products. Separate by at least 2 hours.</td>
</tr>
<tr>
<td>Warfarin (Coumadin)</td>
<td>Take at the same time daily. Limit foods high in Vitamin K content. Avoid abrupt changes in diet. Avoid alcohol. Avoid aspirin-containing products unless ordered by the prescriber.</td>
</tr>
<tr>
<td>Nonsteroidal: Ibuprofen (Motrin), Naproxen (Naprosyn), Ketoprofen (Orudis), Sulindac (Clinoril), Nabumetone (Relafen), Diflunisal (Dolobid), Diclofenac (Voltaren), Celecoxib (Celebrex), etc.</td>
<td>Avoid alcohol. Take with food or milk to avoid stomach upset.</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Avoid alcohol. Take with food or milk to decrease stomach upset.</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Take with food or milk. Limit foods containing caffeine that can increase side effects of theophylline. Follow dietary instructions provided by the prescriber.</td>
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<tr>
<td>MAO Inhibitors: Phenelzine (Nardil), Tranylcypromine (Parnate)</td>
<td>Avoid foods high in tyramine.</td>
</tr>
<tr>
<td>Digoxin (Lanoxin)</td>
<td>Avoid black licorice. Take at the same time daily.</td>
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<tr>
<td>Potassium supplements</td>
<td>Take with food and a full glass of water. Add liquid KCL to juice.</td>
</tr>
<tr>
<td>Metronidazole (Flagyl)</td>
<td>Do not drink alcohol. Avoid cough syrups containing alcohol. Alcohol may cause flushing, headache, nausea, vomiting and cramps.</td>
</tr>
<tr>
<td>Lithium Carbonate (Eskalith)</td>
<td>Take medication with food or milk. Drink 8 glasses of water or other liquids daily. Avoid liquids containing caffeine. It is important to have adequate salt and water intake during hot weather.</td>
</tr>
<tr>
<td>Miscellaneous: Amlodipine (Norvasc), Caffeine, Clarithromycin (Biaxin), Cyclosporine, Diltiazem (Cardizem), Erythromycin, Estrogens, Ketoconazole, Paroxetine (Paxil), Sertraline (Zoloft), Simvastatin (Zocor), Verapamil (Calan, Isoptin), Warfarin (Coumadin)</td>
<td>Avoid grapefruit and grapefruit juices</td>
</tr>
</tbody>
</table>
Foods high in Potassium
Apricots, artichokes, avocado, bananas, broccoli, cantaloupe, raw carrots, dried fruits, dried beans, dried peas, honeydew melon, oranges, orange juice, potatoes, prune juice, sweet potatoes, tomatoes, tomato products, winter squash, and peanut butter

Foods high in Vitamin K
Broccoli, brussel sprouts, chick peas, turnip greens, kale, cauliflower, cabbage, lettuce, liver, herbal teas (especially green tea), meat tenderizer, soy bean oil, green peas, alfalfa, fried or boiled onions, whole milk in excess of four cups

Food high in Tyramine
Aged cheese (exceptions: Cottage and cream), beer, ale, broad beans with pods (lima, soy, lentils and snow peas), dry and fermented sausage (pepperoni, corned beef, salami, bologna), liver, meat extracts (broth, bullion, and gravies), pickled herring and salted dried fish, red wine (chianti, burgundy, sherry and vermouth), sauerkraut, yeast extracts/ brewers yeast, coffee, tea, chocolate, eggplant, tomatoes, red plums, papaya, avocado, figs, raisins, canned soups.

Food containing Caffeine
Coffee, tea, certain carbonated beverages, cocoa, chocolate drugs such as diet aids, decongestants, and pain relievers

In addition to some medications requiring administration before or after meals, there is also potential for interaction between certain foods and medications. It is important to keep in mind the most common food-drug interactions.

Vitamin D Deficiency and the Risk of Falls….continued from page 1

Vitamin D supplementation may help reduce the incidence of falls in the elderly but it is important to remember that vitamin D deficiency and muscle weakness is only one risk factor for falls and fractures in the elderly population. Therefore prevention of falls should be a multi-disciplinary approach.

Article by Jessica Penson, Pharm D Candidate
Compression Stockings and DVT

Compression stockings are used to help support the venous and lymphatic systems of the legs. The stockings provide maximum pressure around the ankle and decrease as they move up the leg. The compression is designed to help the muscle pump of the calf to keep blood flow from remaining stagnant in the lower extremities. When blood flow slows, the chance for clot formation increases.

There is limited data on the use of compression stockings for patients that have suffered from a DVT. The American College of Chest Physicians however, has recommend that patients who have suffered from a DVT use a compression stocking with a pressure between 30-40 mm Hg for a period of 2 years post DVT. This comes from data obtained in three separate trials that showed a statistically significant difference decrease in post-thrombotic syndrome recurrence in those that used compression stockings versus those that did not. The stockings used in these trials were all below the knee type.

Stockings should be worn from the time a patient awakes until bedtime.

Knee high vs. Thigh high stockings: There is evidence that thigh length stockings provide better prophylaxis for post-thrombotic syndrome in patients that have suffered from a deep vein thrombosis. However, it appears that compliance with thigh length stockings is an issue due to comfort. Patients are more compliant with the knee length stockings due to comfort and ease of use. As with drug therapy, compliance is always an issue. If a drug regimen is established that makes a patient more compliant, then a better benefit is usually achieved. The same is most likely true with compression stockings.

The average cost of compression stockings is around 25 dollars with some costing as high as 100 dollars. Hand washing and flat drying will maintain the stockings for the longest period of time.

Fitting: most compression stockings come in a box with sizing charts on the back. The diagram above shows the anatomy to be measured and steps in the measuring process.

- Measure around the ankle just above the round bones on both sides of the ankle
- Measure around the largest part of the calf
- Measure around the largest part of the thigh (for thigh length stockings)
- Measure from base of heel (floor) to back of knee
- Measure from base of heel (floor) to base of buttocks
Heme Positive Stool Checks

What is a Heme Positive Stool Check or a Fecal Occult Blood Test (FOBT)?
This is an OTC test that is used to detect the presence of blood (occult) in the gastrointestinal tract.

How should you prepare before performing a FOBT?
* Avoid the following foods or medications for 3-7 days before the test.
  - Turnips, beets, radishes, horseradish, artichokes, mushrooms, broccoli, bean sprouts, cauliflower, apples, oranges, bananas, grapes, grapefruit, figs, melon, and red meat.
  - Aspirin, vitamin C, iron supplements, NSAIDs, and blood thinners.
* Do not test if there is active bleeding from hemorrhoids.
* Do not test during a menstrual period.
* Do not test a stool sample that has been in contact with toilet bowl cleaning products.
* Remember that 3 different samples over 3 to 5 days should be tested.

How do you perform the FOBT?
There are three types of FOBT: the guaiac-based test, the heme-porphyrin test, and the immunochemical test. The stool sample is collected by using a card, wipe or pad. Regardless of the collection device, it is always important to read all of the instructions on the FOBT before you begin.

One of the most common FOBTs is the guaiac card. This testing method is performed as follows:
Step 1  Fill out the information on the card.
Step 2  Collect a small amount of stool on the end of the applicator (If you use a container to collect the sample, make sure that the container is clean and dry.)
Step 3  Inside box A, apply a thin layer of stool.
Step 4  Inside box B, reuse the applicator, obtain another sample of the stool (from a different place), and smear the sample inside the box.
Step 5  Close the cover of the slide.
Step 6  Complete the other two cards the same way using two different stools.
Step 7  Return all cards within 4 days of the collected sample.

If you have the FOBT that uses wipes - Use a wipe after a bowel movement, and then place some test solution on the wipe. If the wipe turns blue, this means that blood is present in the stool.

If you have the FOBT that uses pads - After a bowel movement place the pad in the toilet. If the water in the toilet turns blue, then blood is present in the stool.

What does a positive FOBT mean?
A positive result means that the test has detected blood in the stool. Three of the most common causes of occult GI blood loss are: reflux esophagitis, erosive gastritis or ulceration, and/or carcinoma (especially in the colon). However, a positive result does not mean a positive indication for cancer or any other illness. The healthcare provider may wish to schedule a colonoscopy or flexible sigmoidoscopy exam and a barium enema in order to locate the source of the bleeding. Other exams that may be ordered to locate the bleeding in the GI tract are upper endoscopy, upper gastrointestinal X-ray or a small bowel X-ray. Also, a test could read positive when there is actually no blood in the stool. This is called a false-positive. Some of the most common reasons for false-positive FOBT results are: epistaxis, gingival bleeding, tonsillitis, or hemoptysis.

For more information about FOBT go to http://www.fda.gov/cdrh/oivd/homeuse-occult.html

By Edie McHone, Pharm D Candidate
Survey Trends

Recent nursing home survey activity has focused on the use of antipsychotic and other mood/behavior altering medications. Please remember the following:

- All medications (including non-psychiatric drugs) must have an indication for use.
- Antipsychotic and Anxiolytic medications may only be used for “acceptable” indications. These are defined in F329 Table 1.
- Facilities are expected to consider, implement, and document non-drug interventions for behavioral control.
- “Target behaviors” to support antipsychotic use must be clearly defined, monitored, and documented. Please refer to the Neil Medical Group Pharmacy Policy & Procedure Manual for detailed information including the procedure for target behavior monitoring using behavioral flow sheets.
- Target behaviors for antipsychotic use in demented patients should represent one or more of the following:
  - Psychotic symptoms (delusions, paranoia, hallucinations, etc.)
  - Behavior representing danger to self/others (biting, hitting, scratching, etc.)
  - Inconsolable, persistent distress; behaviors leading to loss of functional status
- Antipsychotics may not be used for minor behavioral issues such as wandering, irritability, anxiety, insomnia, verbal expressions, etc.

Best Practices

CMS ranks Coumadin as a high risk medication with regards to proper administration and monitoring. In addition, it is the top medication, nationally, involved in litigation. Proper monitoring of PT INR’s and the communication of this information back and forth between the facility and the physician is vital in protecting the resident and maintaining proper outcomes. System failures and/or glitches in communication can lead to devastating consequences. Case Study: Mrs. B was a resident in a facility who was receiving Coumadin 5mg qd. A PT INR was faxed to the MD on 10/5/08 with a value of 3.5. The MD noted on the lab to hold the Coumadin for 3 days and repeat the PT INR. On 10/8/08, the recheck PT INR revealed a value of 1.1. When the lab was faxed to the MD, no information was written on the lab regarding the fact that the Coumadin had been on hold. The MD ordered the Coumadin to be increased to 7mg and the PT INR was to be rechecked in 1 week (10/15/08). The consultant pharmacist was in on 10/15/08 and noticed the above issues and alerted the DON and charge nurse to be on the lookout for the lab-work, since no recommendation could be made to the MD without all the current info. The recheck on 10/15 was never drawn. A routine CBC on 11/5/08 revealed a Hgb/Hct of 4.2/28.6. The resident was hospitalized with a PT INR > 30. Most consultants experience one “near miss” per month involving Coumadin. This Coumadin “stamp” was designed by a consultant pharmacist with Neil Medical as a tool to insure that all pertinent information is communicated to the physician with each lab. This “stamp” is used on all PT INR’s that are faxed to the MD. A second option would be to print this information on self-stick labels that could be applied to the labs and filled out prior to faxing.
When discussing long term care and litigation, it is important to be familiar with certain legal terms. Many law suits involve “breach of duty”. Breach of duty is defined as the failure to exercise care that a reasonable man would exercise under similar circumstances. For a law suit to be filed, the injured party must be able to prove “damages”. From a legal perspective, damages are considered to be a direct result of breach of duty. Damages are losses which can readily be proven to have been sustained and for which the injured party should be compensated. Damages can include medical damages, which would include cost of care and treatment, or pain and suffering, which is a wide open field.

Long Term Care data indicates five top reasons for litigation:

- Resident Falls
- Treatment Issues
  - Decubitus Ulcers
  - Continence Issues
  - Nutrition
- MEDICATION ERRORS
- Abuse or Neglect
- Resident Monitoring
  - Wandering
  - Elopement
  - Restraints

Documentation is the primary means of communication between all members of the health care team. The resident’s medical record should provide an accurate picture of all interactions between the patient and the provider, including assessments, interventions, and outcomes. Thirty-five to forty percent of all malpractice claims are deemed to be indefensible because of documentation problems. Below are the ten most common charting errors in the health care setting. In the coming newsletters, these will be explored in greater detail.

### 10 COMMON CHARTING MISTAKES

<table>
<thead>
<tr>
<th>Mistake</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>1. Failure to record pertinent patient information.</td>
<td>Failure to record vital signs correctly.</td>
</tr>
<tr>
<td>2. Failure to record nursing actions.</td>
<td>Failing to document completion of all care plans.</td>
</tr>
<tr>
<td>3. Failure to record drug reactions OR changes in condition.</td>
<td>Failing to document reactions to antibiotics.</td>
</tr>
<tr>
<td>4. Recording information in the wrong patient’s chart.</td>
<td>Failing to document medication given to the wrong patient.</td>
</tr>
<tr>
<td>5. Writing illegible or incomplete orders.</td>
<td>Failing to transcribe handwritten orders clearly.</td>
</tr>
<tr>
<td>6. Failure to properly document a discontinued medication.</td>
<td>Failing to document discontinuation of medication properly.</td>
</tr>
<tr>
<td>7. Transcribing orders improperly or transcribing improper orders.</td>
<td>Failing to transcribe high-risk medications correctly.</td>
</tr>
<tr>
<td>8. Failure to record that medications have been given.</td>
<td>Failing to document administration of medications.</td>
</tr>
<tr>
<td>9. Failure to follow a specific physician order.</td>
<td>Failing to follow written care plans.</td>
</tr>
<tr>
<td>10. Inappropriate use of abbreviations.</td>
<td>Failing to use abbreviations consistently.</td>
</tr>
</tbody>
</table>

**Write it Right! Tip**

Recognize areas of high risk and try to put systems in place to minimize the risk in these areas. Since Coumadin is a high risk medication, there should be some system to insure that:

- Lab-work is done routinely & as ordered by the physician
- Lab results are promptly communicated to the physician
- A follow-up order is obtained from the physician and noted in the resident’s chart. This should include any dosage change OR order to maintain current dose as well as a time frame for the next lab.
- Order changes and labs are promptly and properly transcribed.
- Old medication doses are promptly removed from the cart.

Tools to improve this system can include the stamp outlined in “Best Practices” or a Coumadin Flow Sheet.
I appreciate all the positive feedback from the last newsletter as well as suggestions for future editions of Pharm Notes! Remember, our goal is to provide our long term care partners with current and pertinent information that you can use in your daily practice. We have had requests from several facilities regarding creative ways to track labs, so that no routine labs are missed. If your facility is willing to share your solution to this common problem, please contact me or your consultant pharmacist, and we will make sure that your ideas are shared in a future newsletter. Maybe you have other innovative solutions to share? We would love to hear from you. Likewise, continue to send input on future topics that you would like to see covered.

Sincerely,

Cathy Fuquay

Pharm Notes is a bimonthly publication by Neil Medical Group Pharmacy Services Division. Articles from all health care disciplines pertinent to long-term care are welcome. References for articles in Pharm Notes are available upon request. Your comments and suggestions are appreciated. Contact:

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1-800-862-4533 ext. 3489

Note: Periodically, we are asked to add a name to our distribution list. At this time, copies of Pharm Notes newsletters are distributed in bulk to Neil Medical Group customers only.