



DIVISION OF QUALITY ASSURANCE
1 WEST WILSON STREET
P O BOX 2969
MADISON WI 53701-2969

Jim Doyle
Governor

Kevin R. Hayden
Secretary

State of Wisconsin

Department of Health and Family Services

Telephone: 608-266-8481
FAX: 608-267-0352
TTY: 888-241-9432
dhfs.wisconsin.gov

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To: Community-based Residential Facilities
Adult Family Homes
Resident Care Apartment Complexes
Facilities for the Developmentally Disabled
Nursing Homes

CBRF 01
AFH 01
RCAC 01
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From: Kevin Coughlin, Bureau Director
Bureau of Assisted Living

Paul Peshek, Bureau Director
Bureau of Nursing Home Resident Care

Via: Otis Woods, Administrator
Division of Quality Assurance

Warfarin Monitoring

Recently, the Division of Quality Assurance has investigated and cited multiple instances where lack of warfarin monitoring has led to outcomes with significant harm to residents. In various settings, the responsibility with **ordering** warfarin and lab tests to monitor the effect of warfarin on bleeding time rests with physicians. However, all members of the interdisciplinary team, which generally includes pharmacists, nurses, nurse aides, and caregiver staff, have a role in monitoring the effects of warfarin on a resident.

In assisted living facilities and nursing homes, the nurses, nurse aides, and caregiver staff who see a resident on a daily basis may be the first to notice problems with bleeding, missed doses of warfarin, changes in condition, new medications added, or missed labs. Nurses, nurse aides, and caregiver staff play an important role by communicating information and observations to members of the interdisciplinary team who have responsibility for managing a resident's warfarin therapy.

In reviewing recent citations related to warfarin, it appears that the standards for monitoring warfarin, and the extent of potential harm, is not known or recognized by staff. The following information is intended for staff members who are working each day with residents who are taking warfarin.

Warfarin or Coumadin® is an anticoagulating medication that is used to prevent blood clotting. Clotting is a concern for residents who may have had a recent stroke, broken hip, and in residents with atrial fibrillation and other conditions where blood clots need to be prevented. Clots can cause additional strokes and even death. Warfarin prevents abnormal clots from forming; however, the challenge is that if too much of the medication is used, then the resident will be at risk of bleeding; and uncontrolled bleeding may cause death. Accordingly, warfarin monitoring is extremely important to a resident's health.

Standards for Warfarin Monitoring

A test called International Normalization Ratio (INR) is the lab test that is routinely performed to monitor warfarin levels. For most individuals a stable, safe INR level will be between 2 and 3.5, depending on the reason for the medication.

When a warfarin regimen is **started**, a baseline INR is typically obtained. This initial INR should be performed within two to three days.

After the initial INR, follow-up INRs may be done every three to five days. INRs are then continued every three to five days until two consecutive stable therapeutic INR readings are established, usually a level between 2 and 3.5.

After the two consecutive INR readings are obtained that are between 2 and 3.5, guidelines support INRs to be drawn weekly for four weeks.

When a resident is **stable** after the weekly INRs, then an INR will be performed **every four weeks** as long as warfarin is being used.

NOTE: The above standards are clinically supported and published by the American College of Chest Physicians. However, as with all standards, physicians or others who are monitoring warfarin may order INRs to be conducted sooner or later to meet specific or unique resident needs. As a nurse, nurse assistant or caregiver, when you see that the accepted standard is not being followed, you should ascertain if there is a legitimate reason for the deviation. You have a responsibility to make sure there is an adequate reason for providing care that is contrary to the accepted standards of practice.

Areas of Clinical Concern

Oftentimes, a resident may be stable while on warfarin; however, other factors may cause the warfarin to become toxic or in some cases ineffective. Facility staff needs to be aware of those circumstances that may compromise warfarin's effect so that they can inform the resident, the resident's family, physician, or pharmacist. Monitoring and additional interventions can then be taken in order to avoid clotting or bleeding. Facility staff needs to include the following in their warfarin monitoring procedures:

Drug Interactions

There are many medications that interact with warfarin. Some medications increase the effect of warfarin, while other medications decrease its effect. In most cases, if a medication is added that interacts with warfarin, an INR should be checked within one week. Subsequent INR readings will be dependent on those initial readings and the length of time that the medication interacting with warfarin will be used. Generally, INR readings will be done as often as every two to four days while a resident is on the offending medication and continued until there is evidence that the medication interaction is stable. If, however, a medication that interacts with warfarin is used short term, and if the INR is within the normal range, or even slightly elevated at the first check, then it is likely that the effects of the warfarin will not be altered.

Resident Condition

Nutrition can play a significant role in the response to warfarin. When residents stop eating, have nausea and vomiting, or start IV therapy, this may significantly affect the response to warfarin. When patients stop eating, change diet, or add supplements; it is important to notify the physician, pharmacist and others who are monitoring the warfarin about this change in the resident's routine. In the event of such changes, the INR should be checked within one week and monitored just like a medication interaction. Subsequent INR readings will be dependent on the resident's condition and INR readings.

Facility Response

It is important for facility staff to understand the risk of warfarin and the importance of adequate health monitoring. Facilities may want to have specific monitoring procedures for those residents currently on warfarin. Additionally, facility staff may also want to establish procedures to assure those residents, who recently had a stroke or suffered a broken hip and are returning to the facility, have a determination if warfarin is going to be used.

Some residents are not appropriate candidates for warfarin, and in some cases, orders for warfarin, INR levels, or other stopping agents, such as heparin, are not clear. If a resident is admitted to the facility and had been on warfarin, heparin, or a low molecular weight heparin, e.g., Lovonex, and there are no admission orders for these medications, then this particular medication issue should be reconciled and confirmed. In addition, if the medications are part of the admission orders, then there should be orders for lab testing, such as an INR test. If nothing is indicated or ordered, it is a good practice to clarify the resident's status as it relates to anticoagulation concerns.

Monitoring Beyond INR

Besides monitoring for INR, facility staff can monitor for signs and symptoms of bleeding. Those symptoms include bruising, bleeding from the gums during teeth brushing, blood in the stool, sudden onset confusion that may indicate bleeding in the brain, or recent changes in breathing patterns or sounds that may indicate bleeding in the lungs. These symptoms need to be reported to the physician and addressed quickly as they may be an indication that warfarin has become toxic.

Warfarin can be a life saving medication; it can also be life threatening. Residents and patients rely upon the caregivers and other members of the interdisciplinary team to make sure warfarin monitoring is conducted to minimize or prevent negative outcomes related to warfarin use. Please share this memo with staff who have a role in warfarin monitoring to prevent unfortunate outcomes.

Resources:

Warfarin Drug Interactions:

<http://www.aafp.org/afp/20000315/1745.html>
<http://www.med.umich.edu/cvc/prof/anticoag/warfarin.htm>
<http://www.amda.com/tools/clinical/m3/topten.cfm>
<http://www.annals.org/cgi/content/full/121/9/676>

Sample Warfarin Policy and Procedures:

<http://www.amda.com/resources/whatsnew2006.cfm#Antithrombotic>
<http://www.americangeriatrics.org/>
<http://www.anticoagulation-advisor.com>

Warfarin Training/Practice Guidelines:

<http://www.amda.com/resources/whatsnew2006.cfm#Antithrombotic>
<http://www.ahrq.gov/consumer/btpills.htm>
http://www.fda.gov/medwatch/safety/2006/coumadin_medguide.pdf
http://www.chestjournal.org/cgi/search?sortspec=relevance&author1=&fulltext=&pubdate_year=2004&volume=126&firstpage=204
<http://www.ascp.com/>