Pediatric Warfarin

*(Brand Name = Coumadin)*

Warfarin is a medication commonly referred to as a “blood thinner.” It is an anticoagulant; anti means against and coagulant refers to blood clotting.

**How does it work?**

There are several proteins in your blood that are involved in making a blood clot. Some of these proteins require vitamin K to make them active. Warfarin lowers vitamin K levels and therefore, reduces the amount of active clotting proteins.

Blood clotting is a normal process that stops bleeding and helps repair broken blood vessels. Imbalances in this process can cause too much clotting leading to blood clots or too little clotting leading to bleeding symptoms. Clots can occur in either arteries (blood vessels filled with oxygen rich blood coming from the heart) or veins (blood vessels returning blood back to the heart and lungs).

- Blood clots that are in large veins of the body are called Deep Vein Thrombosis (DVT).
- Blood clots that are formed can break up and travel within vessels and end up in the lungs (called pulmonary embolism or PE) or in the brain (called a stroke).

When an abnormal blood clot occurs, the site of the clot can cause irregular blood flow and trigger even more blood clotting which can lead to symptoms of pain, swelling and blockage of normal blood flow.

Anticoagulation therapy prevents additional clotting at the site and prevents the blood clot from traveling to other sites. Your medical team will consider a number of factors in determining the length of time anticoagulation therapy is needed. Often, this time can range anywhere from 3–6 months, as this is the length of time it takes the blood vessel to heal over.

In individuals with mechanical heart valves, the flow of blood through the valve is irregular and can trigger the blood to clot. Therefore, anticoagulation therapy is usually required for life to prevent abnormal blood clotting from occurring.
How is it given?

Warfarin is a pill taken by mouth once a day. It comes in several strengths: 1mg, 2mg, 2.5mg, 3mg, 4mg, 5mg, 6mg, 7.5mg, and 10mg tablets. It is important to know your current dose. It is common for the dose to be changed based on lab results. Your prescription may be written for particular strengths and it is likely that a combination of different strengths may be used to make the complete daily dose. Some examples include:

- Dose 3.5mg (One 3mg tablet and ½ tablet of 1mg); or
- Dose 8mg (Two 4mg tablets).

Warfarin has a long half-life meaning its effects last in the blood for a long time after taking a dose. Typically, it takes 3–7 days for the full effect to start. Once on the medication, it takes 3–7 days for the effect to wear off.

Warfarin should be given at the same time daily. We recommend that it be given in the evening. This allows for dosing adjustments to be made on the same day lab testing is performed.

If you miss a dose:

- Take it as soon as you remember on that same day.
- If it is the next day after 9am, do not take a double dose or extra warfarin to make up for a missed dose.
  - Simply skip the missed dose, make a note, notify your medical provider, and take that day’s dose as scheduled.
- If it is before 9am, you may take the prior night’s dose in the morning and your scheduled dose that evening at 9pm or after.

As it is very important to take the medication every day, a routine should be established in your home to help you remember. Examples include using a pill box, using a calendar, taking the medication prior brushing your teeth before bed, etc.

Make sure you have plenty of warfarin medication and refill the prescription at your pharmacy the week before you run out.

When traveling make sure you request a refill or travel amount at your pharmacy before you leave.

Warfarin should be stored at room temperature and in a light-resistant container.

How is it monitored?

Since warfarin affects blood clotting, it is key to maintain the level of medication within a range that effectively prevents too much clotting but does not cause too much bleeding. To do this, the patient’s prothrombin time (PT) is measured. The PT is a lab test run on your blood sample that measures how quickly your blood clots in seconds. Different labs use different agents in order to run the PT test and therefore, a standard measure called the International Normalized Ratio or INR is used, so that results are standardized across all laboratories. A goal INR is set by your health care team when you start warfarin based on your own medical needs. Often, this goal is between 2–3.
In the beginning of therapy, the INR is checked frequently. Once the goal is achieved and the patient’s INR is stable on a particular dose, testing is spaced out. Often, testing is weekly and once stable (which means no fluctuations in lab results over a period of weeks) it may be spaced out.

Laboratory monitoring is done through a venous blood sample. In some cases, the use of a home INR monitor may supplement monitoring. A standing order for the PT/INR test will be provided to your laboratory of choice. Standing laboratory orders often need to be updated every 6 months.

**Effects on warfarin**

**Diet**

**Vitamin K**

As warfarin interferes with the ability of certain clotting proteins to interact with vitamin K, it is important to be aware of the amount of vitamin K that is taken in your diet.

- Vitamin K is an important vitamin so it should not be taken out of your diet but rather it is important for you to be aware of how much you consume on a regular basis and avoid large changes in intake.

- **Consistency** in intake is the essential point. Large amounts of vitamin K reverse the effects of warfarin, meaning it can increase the risk of clotting.

- Some vitamin K rich foods include:
  - Liver
  - Broccoli
  - Cabbage
  - Spinach
  - Soybeans
  - Cauliflower
  - Collard greens
  - Lentils
  - Garbanzo beans
  - Turnip greens
  - Brussels sprouts/Alfalfa
  - Mustard greens/Lettuce
  - Cucumber
  - Asparagus
  - Pistachio nuts
  - Kale
  - Green tea

Cranberries can increase the INR, increasing the risk for bleeding.

**Other medications/supplements**

- Warfarin interacts with many prescription drugs (in particular antibiotics and steroids), over the counter drugs and supplements (including herbals and teas, vitamin, oils).
• It is recommended to check with the UCSF Division of Pediatric Hematology/Oncology prior to starting, stopping or changing medications or supplements. More frequent monitoring may be required if changes in other medications or supplements occur.

• Unless directed by your medical provider, you should avoid the use of aspirin, Plavix, Aleve, and ibuprofen (Motrin, Advil) while on warfarin as these medications affect your platelet function and add to the risk of bleeding.

**Illness**

During times of illness when food intake is affected or significant diarrhea or vomiting occurs, the INR may change dramatically. The UCSF Division of Pediatric Hematology/Oncology should be notified in these times and a plan for monitoring can be recommended.

**Safety recommendations**

**Activity**

Exercise and physical activity are important components of health. They should continue as age appropriate and in the context of being on an anticoagulant. Activity recommendations are made to reduce your risk of trauma-related bleeding and in particular, head trauma.

• Use protective gear (such as helmet, elbow pads, shin guards, etc.) as indicated in certain activities.

• The following, rated as dangerous by the National Hemophilia Foundation, are not recommended:
  
  - BMX racing
  - boxing
  - competitive diving
  - football
  - contact martial arts
  - mountain biking
  - weight/ power lifting
  - rock climbing
  - rodeo
  - rugby
  - motorized scooters/ motorcycling
  - snowmobiling
  - trampoline
  - wrestling
  - motorized scooters/ motorcycling
  - snowmobiling
  - trampoline
  - wrestling

• The following activities carry an increased risk for head trauma or bleeding and should be avoided:
  
  - downhill skiing
  - snowboarding
  - scuba diving
  - horseback riding
  - diving
  - skateboarding
  - high speed roller coasters

• Participation in other sports where contact is common should be taken with caution.
• A school letter will be provided indicating these recommendations. Participation in physical education programs is encouraged with the modifications above noted.

• Ensure a safe environment for younger children/toddlers. Use:
  o appropriate fitting car seats
  o gated stairs
  o safety belts on high chairs and strollers
  o carpeted play areas
  o avoid sharp toys and high play structures

**Procedures**

Before any invasive procedure, such as surgery or dental work, please notify the UCSF Division of Pediatric Hematology/Oncology. The notification should occur 2 weeks in advance of procedures, as it takes time for warfarin’s effect to wear off. Other medical providers should also be notified that you are on warfarin. Typically, standard dental cleaning does not require any changes in your warfarin therapy. However, the anticoagulation often needs to be modified before other dental procedures or any other invasive procedure. At times, “Bridging Therapy” may be required with a shorter acting anticoagulant 1 week prior to the procedure. If the patient should need care in the Emergency Room setting for any reason, the UCSF Division of Pediatric Hematology/Oncology should be contacted at (415) 476-3831 for the 24 hour on-call physician.

**Medic-alert**

Individuals on anticoagulation should wear medical-alert identification so that in the event of injury, emergency medical professionals can be informed of their warfarin therapy. This will ensure that appropriate reversal medications are administered in a timely fashion to reduce bleeding.

**Avoiding pregnancy**

Warfarin has significant adverse effects on the developing fetus. **Do not take warfarin** if you are pregnant or planning to get pregnant. Appropriate contraception should be taken to avoid pregnancy. Please speak with your medical provider about appropriate measures, as standard oral contraceptive pills or estrogens often must be avoided due to their increase risk of clotting.

**Communication**

Communication with the UCSF Division of Pediatric Hematology/Oncology is essential for the success of your therapy. Studies have shown that good communication increases safety and effectiveness of warfarin therapy while reducing the complication risks.
**Laboratory monitoring**

On your discharge, a date will be scheduled for your next lab check. Typically labs are ordered “Stat” so that results are faxed on the same day to our office. However, some labs send their specimens to other centers for processing. This means that it often takes 24 hours before the result is received by our office.

You will be contacted either on the day of your lab draw or the following day by your Nurse Practitioner to review the dosing recommendation of warfarin for the following week. If you do not hear from our office after going to the lab, please call us as this means the result was likely not received from the lab. When you are contacted, the PNP will schedule another lab date with you over the phone and you will be placed on our calendar. Should you miss a lab date, our administrative assistant will contact you to confirm that you went to the lab or to re-schedule your date.

**Clinic follow-up**

Standard follow up in our clinic is scheduled for 1 month following your discharge, 3 months after starting therapy and then 6 months after starting therapy. If you require long-term anticoagulation, annual clinic follow up is recommended. Clinic appointments can also be made as needed.

**Remember to call (415) 476-3831 if you:**

- have symptoms of abnormal bleeding, blood clot
- are injured or seeking care in an Emergency Room
- require procedures including dental work or surgery
- have a change in medication or supplement
- have illness with vomiting or diarrhea
- are pregnant or are planning to get pregnant
- cannot make a scheduled visit or lab date
- have a change in address or phone number
- need warfarin refills
- will be traveling (prior the time of your scheduled lab draw)
- have not heard from our group 24 hours after you have been to the lab
- have any questions or concerns about your warfarin therapy