

# 1. Blood or organ donation and thrombophilia

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## **Q1: I am on coumadin® (warfarin). Can I donate blood?**

A1: No. A person on coumadin® (warfarin) will not be accepted as a blood donor because of the risk of bleeding to him/her when the vein in the arm is entered with a big needle.

## **Q2: Can people with factor V Leiden donate blood? Should you donate organs if you have factor V Leiden?**

A2: Yes, individuals with factor V Leiden and other thrombophilias can donate blood and can (and, in my opinion, should) be organ donors. There are no problems. However, if a person with factor V Leiden is on warfarin, he/she will not be accepted as a blood donor.

### **Donating Blood - the Person on Coumadin® (Warfarin):**

Because of the risk of bleeding at the insertion site of the venous catheter in the arm, a person on warfarin is not allowed to donate blood. The Red Cross eligibility guidelines are found at [www.redcross.org/services/biomed/0,1082,0\\_557\\_00.html#inf](http://www.redcross.org/services/biomed/0,1082,0_557_00.html#inf). The reworded essentials of these policies are:

- \* Aspirin: You can donate blood while on aspirin. However, for platelet donation (by apheresis): wait 48 hours after taking aspirin or any medication containing aspirin before donating.
- \* Plavix® (Clopidogrel): You can donate blood while on Plavix®. However, for platelet donation (by apheresis): wait 7 days after taking Plavix® before donating.
- \* Coumadin® (warfarin), heparin or other prescription blood thinners (such as Lovenox®, Fragmin®, Innohep®, Arixtra®, etc.) you should not donate. If you discontinue your blood thinners, wait 7 days before returning to donate.

### **Other Blood and Organ Donation Issues**

Blood consists of two components:

- a) blood cells (red cells, white cells, platelets),
- b) plasma (the fluid part with all the important blood proteins)

When you donate blood, your blood will be prepared in such ways, that various useful products result. The blood is spun (centrifuged), so that blood cells and plasma separate. The blood cells are then further prepared so that red cell concentrates with few white cells and platelets result. These are called packed red blood cells (PRBCs) and are the bags of blood that people usually refer to when they say they had a "blood transfusion". Since factor V is a clotting protein, it is contained in the plasma, but not in packed red blood cells bags.

The plasma part of blood is further processed into various products, such as

- a) fresh frozen plasma (FFP)
- b) albumin
- c) cryoprecipitate
- d) ivIg (intravenous immunoglobulin)

Fresh frozen plasma is a concentration of the clotting factors and thus contains factor V, and, in the patient with factor V Leiden, the abnormal factor V protein. If you transfuse this plasma to bleeding patients, do they then develop clots because of the transfused factor V Leiden? This is highly unlikely, since the transfused FFP gets immediately diluted after transfusion by the patient's own plasma, which in most cases contains normal factor V. Therefore, only a small amount of the factor V circulating in the transfused patient is the abnormal factor V Leiden. This amount is likely too small to cause any problems with too much clotting. Getting FFP from a factor V Leiden donor is therefore not a problem.

Organ transplantation from a donor who has factor V Leiden in most cases does not cause any negative effects on the recipient, such as an increased clotting tendency after transplantation. However, from a theoretical standpoint, there are

2 types of organ transplants that need special consideration:

- a) liver transplantation
- b) bone marrow transplantation

These issues are complicated. The thoughts are as follows: Most of our clotting factor V is produced in the liver, from where it is excreted into the plasma. It then circulates in our blood. However, some factor V may also be produced in the bone marrow, in the precursors of our platelets (termed megakaryocytes). Research has not satisfactorily clarified this production issue. The bone marrow factor V is stored in the platelets, which then circulate in our body. When we have an injury, either the freely circulating plasma factor V, or the factor V that is stored in platelets and gets released at the site of injury, helps us stop bleeding. Which of these 2 sources of factor V is more important, is not known.

Now, imagine the patient who gets a liver transplant from a donor with factor V Leiden. That patient will have 2 types of factor V after transplant: the normal factor V produced in the bone marrow and the factor V Leiden produced in the liver. Also, imagine the patient who gets a bone marrow transplant from a donor with factor V Leiden. That patient will also have 2 types of factor V after transplant: the factor V Leiden produced in the bone marrow and the normal factor V produced in the liver. Since research has not clarified which of these 2 factor Vs is more important for clotting, we do not know whether receiving a liver transplant or a bone marrow transplant from a factor V Leiden individual has any negative effects, such as an increased clotting tendency. If any such increased clotting tendency does occur, it would likely be mild.

These issues are of importance for the patient who has Budd-Chiari syndrome (clotting of the veins of the liver). This syndrome may lead to liver failure, making liver transplantation necessary. If the patient has inherited factor V Leiden, one can postulate that it was factor V Leiden that made the liver veins clot. If the patient has received a liver from a donor that did not have factor V Leiden, the patient may not have an increased clotting tendency after the transplant, since the liver now makes normal factor V, and one could argue that warfarin (coumadin®) does not need to be given any more after the transplant. However, since the bone marrow still makes factor V Leiden, the patient may still be at increased risk for clotting, and one could argue for continuing warfarin (coumadin®) after the transplant.

Since research has not clarified these issues, and since patients with Budd-Chiari syndrome may also have a yet undetected abnormality in addition to factor V Leiden that made them clot, this is the practical approach I take: I keep most patients with Budd-Chiari syndrome who underwent liver transplant on warfarin (coumadin®) indefinitely. Since patients with Budd-Chiari syndrome may also have esophageal and gastric varices, warfarin (coumadin®) may not be safe in these patients. As always, an individual decision needs to be made.