

17. INR

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Q1 "Everybody on the list talks about their INR. I have no idea what mine is."

A1: If you are not on warfarin (=coumadin®) your INR is, in most circumstances, normal (i.e. around 1 – usually between approximately 0.8 and 1.2). If a patient is on warfarin (=coumadin®), I strongly advise him/her to become familiar with his/her INR, ask the physician for the value each time the INR is checked, and record it together with the warfarin (=coumadin®) dosing on a flow sheet (such as a coumadin® booklet or a spreadsheet).

Q2: "I am 57. I started having venous clots in my 20's. I am on a minimum of 10 mg coumadin daily with my PT kept between 19-25 at all times."

A2: The patient is referring to his/her PT measured in seconds: 19-25 sec. Only talking about the PT and not the INR is not good, because it may lead to a wrong assessment of the warfarin (=coumadin®) effect, since the PT expressed in seconds is not standardized. Physicians and patients should always use the INR (= International Normalized Ratio), never the "PT in seconds" or the "PT ratio".

Q3: "What is the recommended range for PT and INR? I was reviewing my lab results when I was being diagnosed for thrombophilic conditions, and I noticed that my INR prior to being diagnosed was 0.8. A note right below it said that the recommended range was 2 - 3, so I obviously was in trouble at that time. Right now my INR is at 2.47. My doctor seems satisfied with that, and I am glad that the INR is closer to normal. But I just want to know what my target INR should be".

A3: The terms "normal" and "recommended range" are something completely different. The term "normal" refers to the INR value that patients have who are not on warfarin (=coumadin®). Thus, the value of 0.8 in the above patient was normal (normal INR is between approximately 0.8 and 1.2). When a patient is treated with warfarin (=coumadin®), the goal is to thin the blood to a degree that the INR is increased into a "recommended range" (= target INR range = therapeutic INR range). Your doctor should tell you your target INR range. The target INR range for most patients with DVT or PE is 2.0 – 3.0, but may differ in some patients

Q4: "I'm new to all of this FV Leiden stuff. I was going over some labs today and on one day my INR was 1.05. Does anyone know what that means? From what I understand your INR should be between 2.5 and 3.0. Is having an INR of 1.05 for a normal person (someone who does not have FV Leiden) dangerous enough that blood thinner should be used?"

A4: Mostly anybody who is not on warfarin (=coumadin®), whether he/she has factor V Leiden or not, has a normal INR, i.e. a value of approximately 0.8 to 1.2. Factor V Leiden does not influence the INR. Thus, the above patient's INR of 1.05 was perfectly normal and expected. An INR value in a person who is not on coumadin® never predicts whether that person will develop a clot or not. Thus, a value of 1.05 is not a reason to put a person on a blood thinner.

Q5: "After my first clotting episode, I was put on Coumadin therapy for 3 months and will be resuming aspirin thereafter. Once aspirin therapy begins, should INR testing continue? Is this practice unheard of?"

A5: INR testing should not continue. Once off warfarin (=coumadin®) your INR will be normal. Thus, there is no value in monitoring INRs in patients who are not on warfarin (=coumadin®). Aspirin has no influence on the INR. I have never heard of that practice (and hope I never will).

Q6: "Is it true that Protein S deficiency directly affects the ability to keep the INRs at a consistent elevated level and therefore significantly increases the amount of life-long testing needed to maintain the desired level."

A6: This is not correct. Protein S deficiency has no influence on the INR and has nothing to do with the way the INR is measured. INRs in patients with protein S deficiency are just as easy (or difficult) to maintain as in patients who do not have protein S deficiency.

Warfarin (=coumadin®) prevents your blood from clotting too easily. It does that by preventing some of the clotting factors in the liver from being formed. Some people use the expression that warfarin (=coumadin®) "thins" the blood, but, technically speaking, that term is not correct: blood of patients on warfarin (=coumadin®) is of normal thickness (= viscosity). It just takes longer to clot. However, as a figure of speech the term "coumadin thins the blood" is often used. Everybody needs a different dose of coumadin and there is little that predicts how much a person will need. It is therefore necessary to monitor the effect of coumadin so that the patient is not over- or underdosed. Otherwise, bleeding or re-clotting may occur.

The PT (\equiv prothrombin time; "protime") measures, how "thin" the blood is. It measures how many seconds the patient's blood plasma takes in the test tube to clot, after the plasma has been activated by an added lab reagent. The thinner the blood, the longer it takes to clot, and the longer is the PT. Because the clotting time also depends on the strength of the lab reagent used, a value is calculated from the PT that takes the strength of the reagent into consideration. The result is a value called INR (= International Normalized Ratio). This value is standardized, making it comparable from one lab to the other: a value of 2.5 in one lab equals a value of 2.5 in another lab. The PT expressed in seconds is not standardized, meaning that one gets discrepant results between different labs, and should therefore not be used to monitor warfarin (=coumadin®) therapy. The same is true for the so-called "PT ratio", which is unfortunately still used by some physicians and patients.

Interpreting the INR:

- A person not on warfarin (=coumadin®) has a value around 1.0 (usually between 0.7 - 1.3). This is called a "normal INR".
- Once a patient is on coumadin, the INR increases. The higher the INR, the "thinner" the blood. Patients with DVT or PE are often kept at a target INR range of 2.0 - 3.0. This is also called "therapeutic INR range". If the INR is above 3.0 in that patient, the blood is too "thin"; if the INR is below 2.0, the blood is not "thin" enough.
- If a patient has had a second clot in spite of a therapeutic INR, the physician may increase the target INR range to 2.5 - 3.5 or even to 3.0 - 3.5. If one gets above 3.5, there is usually no increased benefit regarding the protection from blood clots, but the risk of bleeding increases significantly.
- Some patients who have a lupus anticoagulant that influences the INR, rendering the INR unreliable. Warfarin (=coumadin®) therapy in these patients needs to be monitored by a test different to the INR, such as factor II level, chromogenic factor X level, or the P&P test