

Indications
Follow-up

Vitamin K Antagonist

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AF



Table 9 Approach to thromboprophylaxis in patients with AF

Risk category	CHA ₂ DS ₂ -VASc score	Recommended antithrombotic therapy
One 'major' risk factor or ≥ 2 'clinically relevant non-major' risk factors	≥ 2	OAC ^a
One 'clinically relevant non-major' risk factor	1	Either OAC ^a or aspirin 75–325 mg daily. Preferred: OAC rather than aspirin.
No risk factors	0	Either aspirin 75–325 mg daily or no antithrombotic therapy. Preferred: no antithrombotic therapy rather than aspirin.



VKA

Table 10 Clinical characteristics comprising the HAS-BLED bleeding risk score

Letter	Clinical characteristic ^a	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

^a'Hypertension' is defined as systolic blood pressure > 160 mmHg. 'Abnormal kidney function' is defined as the presence of chronic dialysis or renal transplantation or serum creatinine $\geq 200 \mu\text{mol/L}$. 'Abnormal liver function' is defined as chronic hepatic disease (e.g. cirrhosis) or biochemical evidence of significant hepatic derangement (e.g. bilirubin $> 2 \times$ upper limit of normal, in association with aspartate aminotransferase/alanine aminotransferase/alkaline phosphatase $> 3 \times$ upper limit normal, etc.). 'Bleeding' refers to previous bleeding history and/or predisposition to bleeding, e.g. bleeding diathesis, anaemia, etc. 'Labile INRs' refers to unstable/high INRs or poor time in therapeutic range (e.g. < 60%). Drugs/alcohol use refers to concomitant use of drugs, such as antiplatelet agents, non-steroidal anti-inflammatory drugs, or alcohol abuse, etc. INR = international normalized ratio. Adapted from Pisters et al.⁶⁰

Bleeding

Therapeutic window

Vitamin K Antagonist

Clinical events ↑

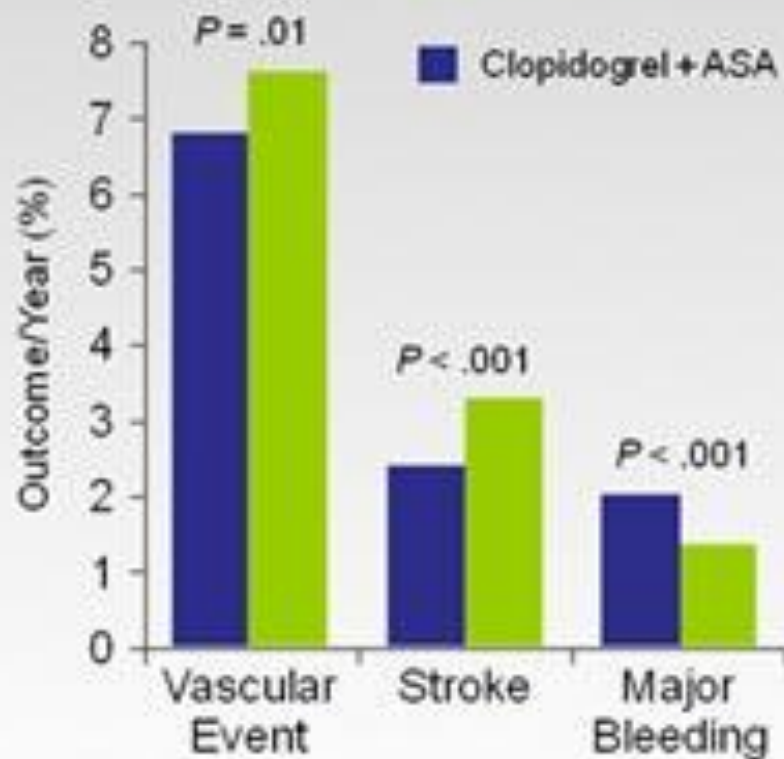
58

% of the time

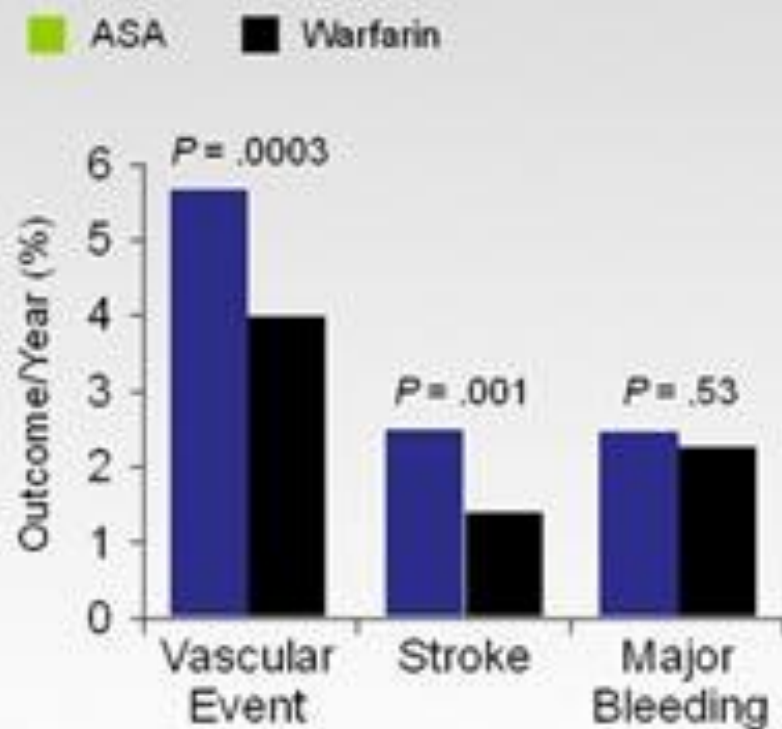
Intensity of anticoagulation (INR) →

ACTIVE Trials

ACTIVE A:
7554 randomized patients;
median follow-up of 3.6 years

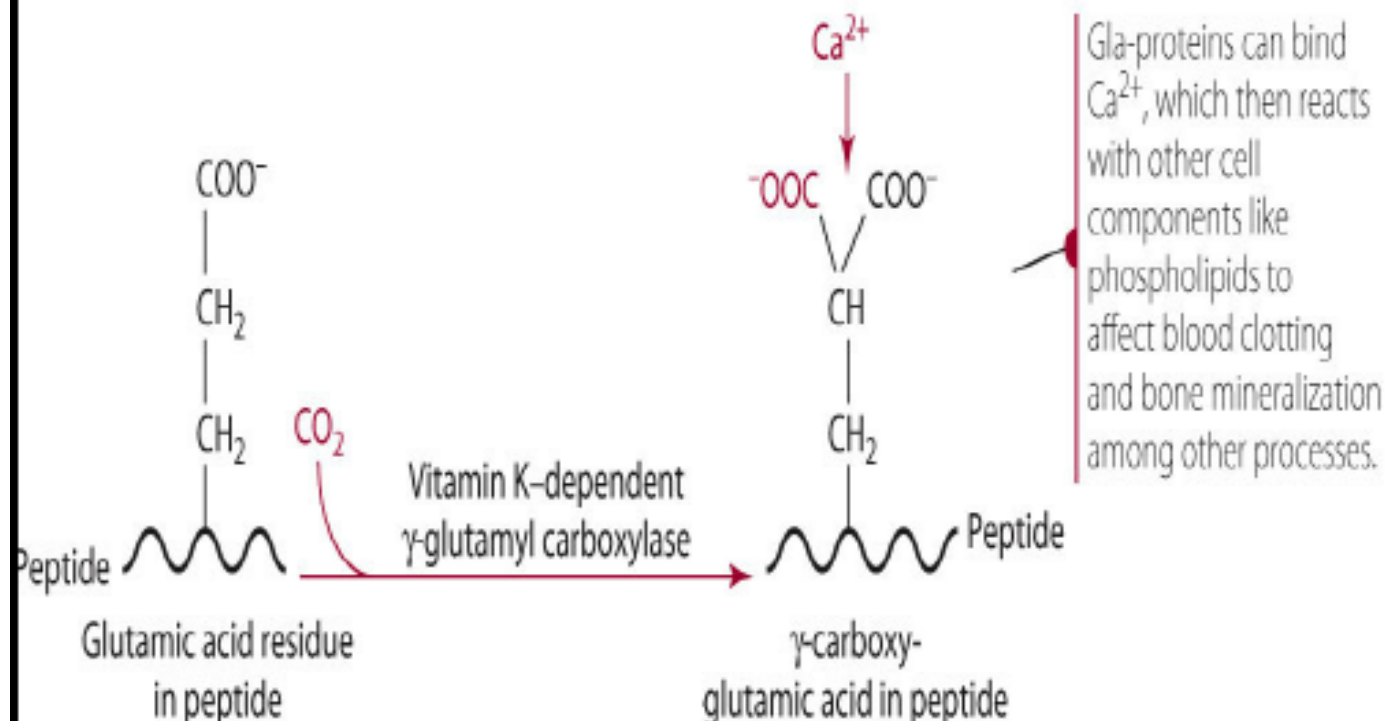


ACTIVE W:
6706 randomized patients,
trial stopped

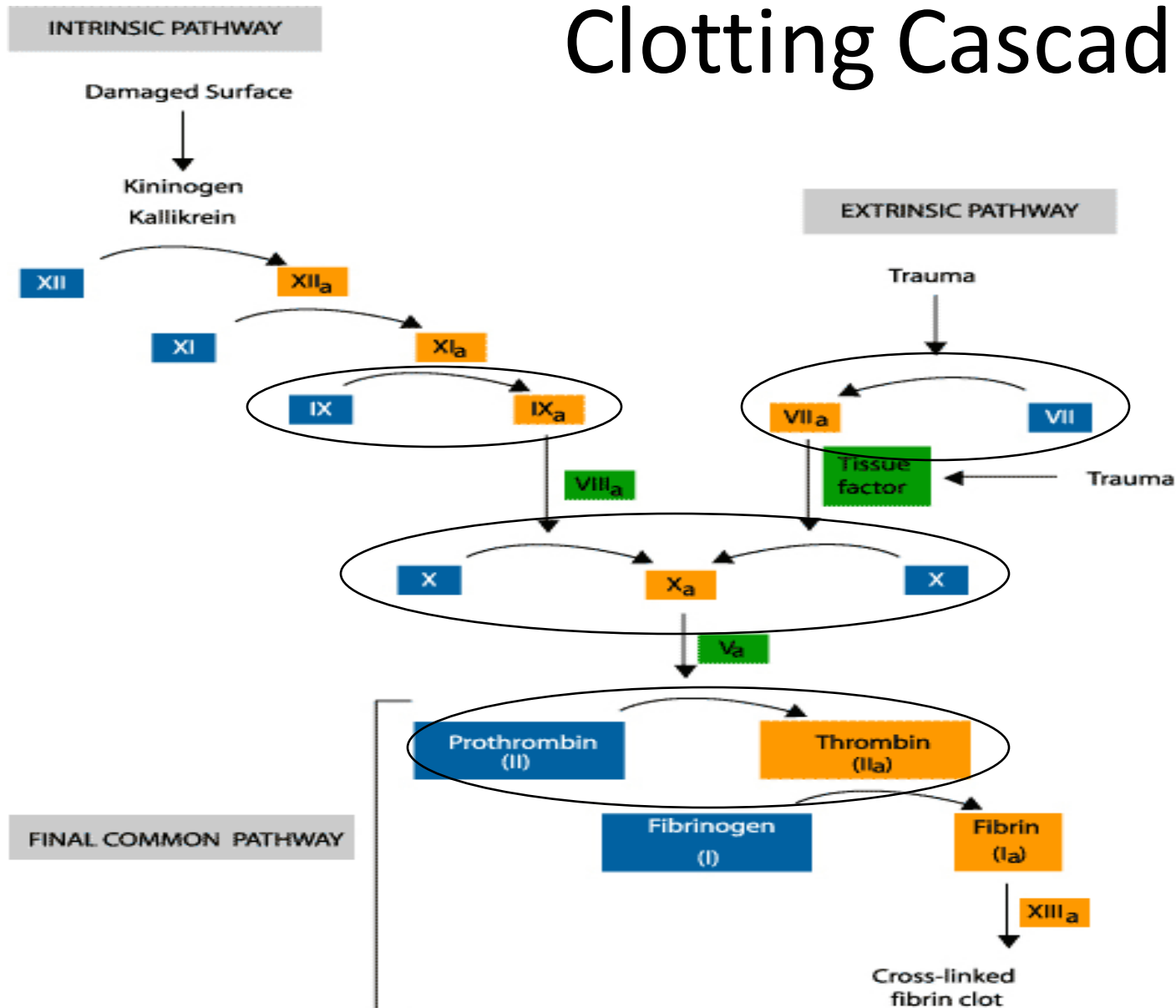


ACTIVE = AF Clopidogrel Trial with Irbesartan for Prevention of Vascular Events

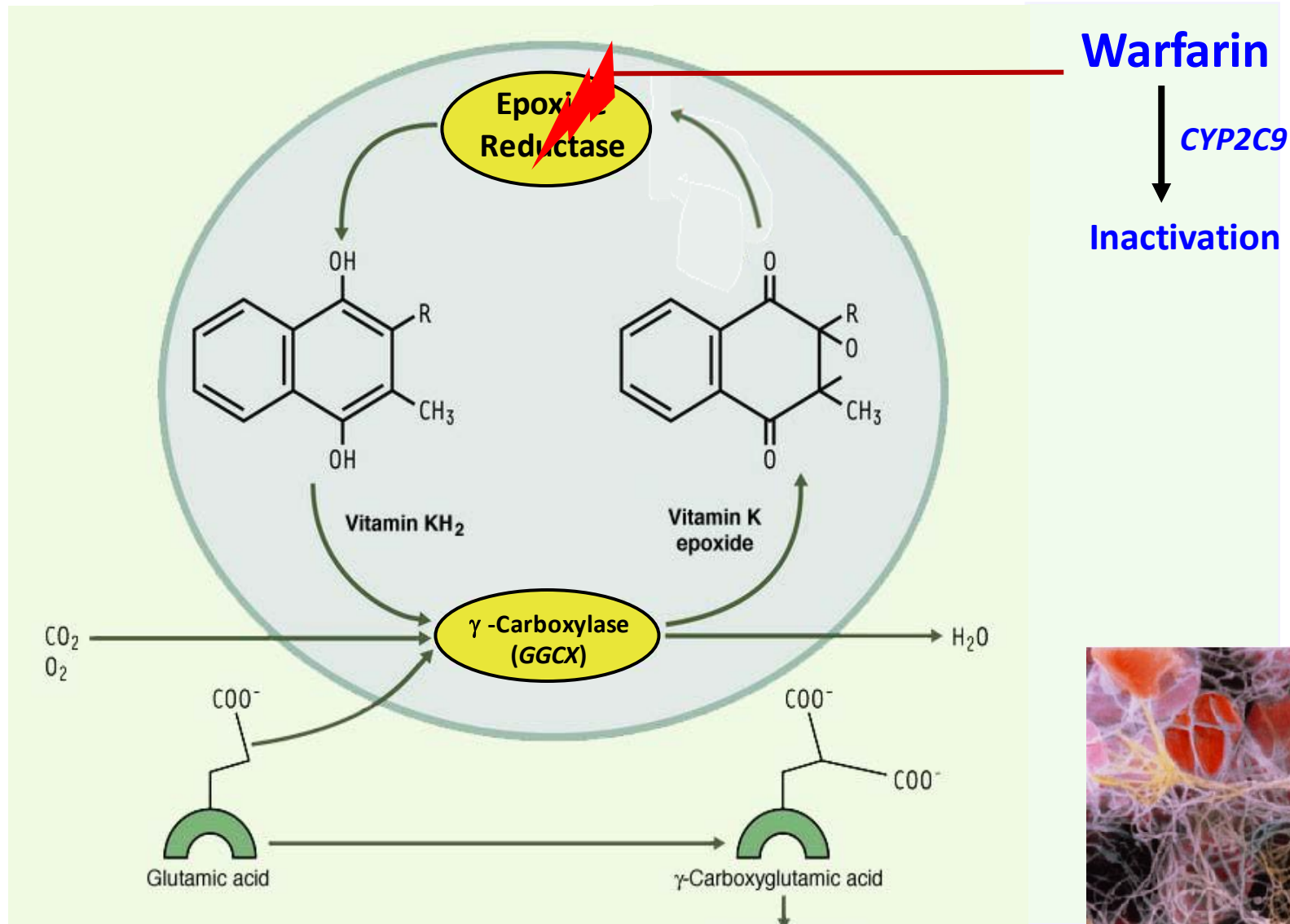
Production of Gamma carboxy glutamic acid (Gla) via Vitamin K-dependent Carboxylation



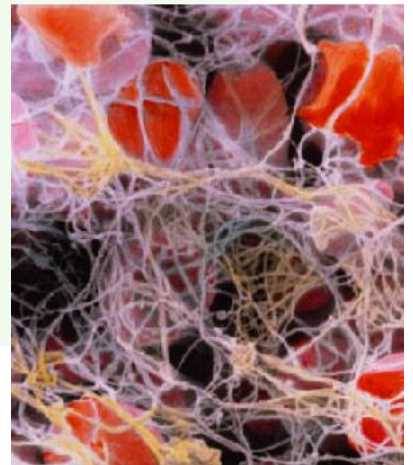
Clotting Cascade



Warfarin inhibits the vitamin K cycle



**Vitamin K-dependent clotting factors
(FII, FVII, FIX, FX, Protein C/S/Z)**



A solid blue rounded rectangle with a thin dark blue border, serving as a background for the text.

Indications

Mechanical Heart Valves

- Aortic: 2.5
- Mitral: 3
- Double: 3
- +Risk Factors (AF): 3

Bioprosthetic Heart Valves

Mitral: 2.5

Atrial Fibrillation

Chadsvasc risk factors [click on present risk factors]

RISK FACTORS	SCORE
Congestive heart failure	1
Hypertension	1
Age ≥ 75	2
Age 65-74	1
Diabetes mellitus	1
Stroke/TIA/thrombo-embolism	2
Vascular disease	1
Sex Female	1
Your score	0

2012 focused update of the ESC Guidelines for the management of atrial fibrillation

An update of the 2010 ESC Guidelines for the management of atrial fibrillation

Developed with the special contribution of the European Heart Rhythm Association

Recommendations for prevention of thromboembolism in non-valvular AF

Recommendations	Class ^a	Level ^b	Ref ^c
Recommendations for prevention of thromboembolism in non-valvular AF—general			
Antithrombotic therapy to prevent thromboembolism is recommended for all patients with AF, except in those patients (both male and female) who are at low risk (aged <65 years and lone AF), or with contraindications.	I	A	21, 63, 104, 105, 106
The choice of antithrombotic therapy should be based upon the absolute risks of stroke/thromboembolism and bleeding and the net clinical benefit for a given patient.	I	A	21, 63, 105
The CHA ₂ DS ₂ -VASc score is recommended as a means of assessing stroke risk in non-valvular AF.	I	A	25, 36, 39
In patients with a CHA ₂ DS ₂ -VASc score of 0 (i.e., aged <65 years with lone AF) who are at low risk, with none of the risk factors, no antithrombotic therapy is recommended.	I	B	21, 36, 82
In patients with a CHA ₂ DS ₂ -VASc score ≥2, OAC therapy with: • adjusted-dose VKA (INR 2–3); or • a direct thrombin inhibitor (dabigatran); or • an oral factor Xa inhibitor (e.g. rivaroxaban, apixaban) ^d ... is recommended, unless contraindicated.	I	A	3, 4, 70, 82
In patients with a CHA ₂ DS ₂ -VASc score of 1, OAC therapy with: • adjusted-dose VKA (INR 2–3); or • a direct thrombin inhibitor (dabigatran); or • an oral factor Xa inhibitor (e.g. rivaroxaban, apixaban) ^d should be considered, based upon an assessment of the risk of bleeding complications and patient preferences.	IIa	A	33, 44
Female patients who are aged <65 and have lone AF (but still have a CHA ₂ DS ₂ -VASc score of 1 by virtue of their gender) are low risk and no antithrombotic therapy should be considered.	IIa	B	33, 44
When patients refuse the use of any OAC (whether VKAs or NOACs), antiplatelet therapy should be considered, using combination therapy with aspirin 75–100 mg plus clopidogrel 75 mg daily (where there is a low risk of bleeding) or—less effectively—aspirin 75–325 mg daily.	IIa	B	21, 26, 51, 109

Atrial Fibrillation

HASBLED clinical characteristic [click on present risk factors]

CLINICAL CHARACTERISTIC	POINTS AWARDED
Hypertension	1
Abnormal liver function	1
Abnormal renal function	1
Stroke	1
Bleeding	1
Labile INRs	1
Elderly (Age >65)	1
Drugs	1
Alcohol	1
Your score	0

Atrial Fibrillation

AF: 2.5

Deep Vein Thrombosis

DVT: 2.5

Pulmonary Embolism

PE: 2.5

An Evaluation of a New Anticoagulant, Acenocoumarin (Sintrom)
MURRAY WEINER, MARIANO JIMINEZ and IRWIN KATZKA

Circulation. 1956;13:400-403

doi: 10.1161/01.CIR.13.3.400

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**An Evaluation of a New Anticoagulant,
Acenocoumarin (Sintrom)**

Single dose

Follow-up



*Palo Alto Medical
Foundation*

A Sutter Health Affiliate

Warfarin (Coumadin[®]) and Your Diet

How does what I eat affect warfarin?

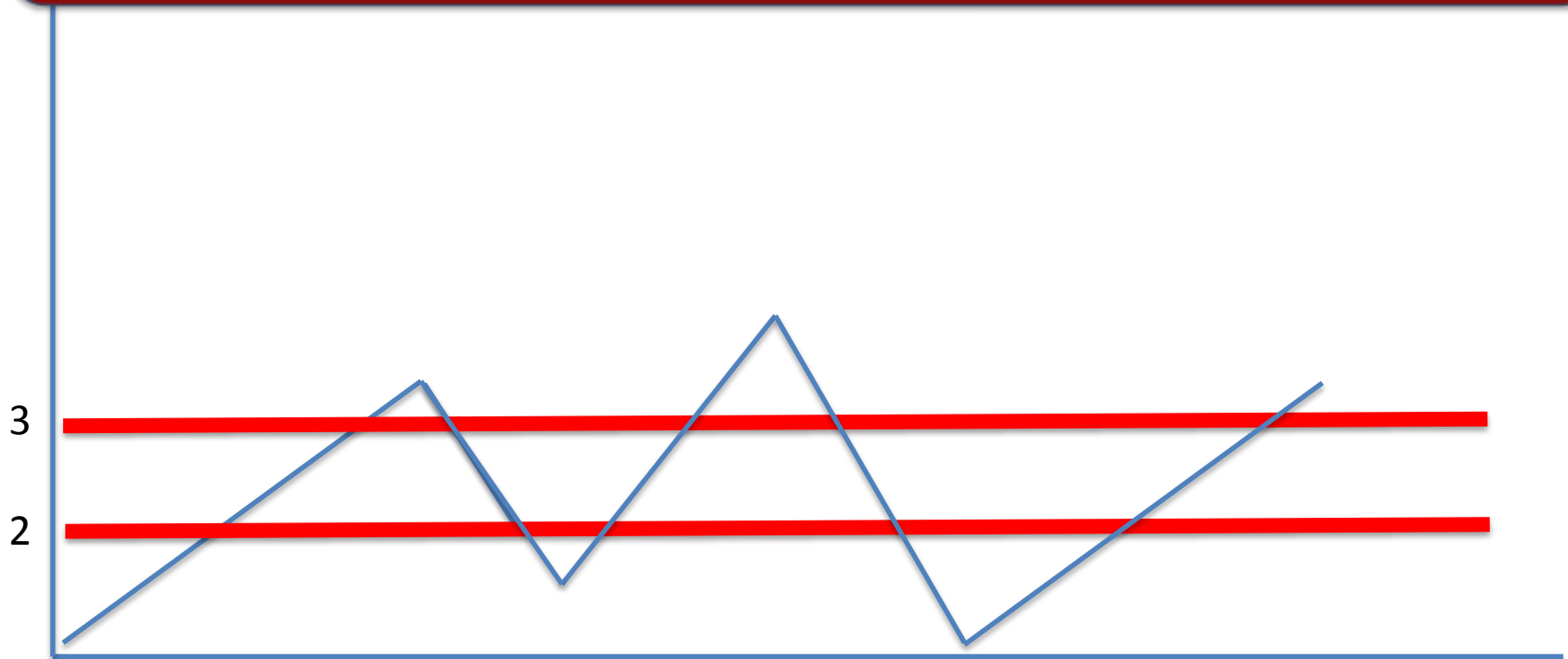
Foods that are high in vitamin K can affect the way warfarin works in your body. Vitamin K helps your blood clot and works against warfarin. The more vitamin K-rich foods you eat, the lower the levels of warfarin in your body. This means your INR will be lower, and you will be more likely to form a blood clot.

More vitamin K-rich foods



Lower INR (warfarin level)

Food and VKA



Do I need to avoid foods high in vitamin K?

No. Although vitamin K works against warfarin, it is an important part of your diet and actually helps keep your warfarin levels balanced. It is okay to eat as many vitamin K-rich foods as you like, as long as you can maintain a consistent diet week-to-week. Your warfarin dose can be adjusted to take into account your diet.

What does a “consistent” diet mean?

A consistent diet means that on a weekly basis, you eat roughly the same amount of vitamin K-rich foods. You could choose to eat vitamin K-rich foods every day, twice per week or three times per week—whatever you like. What’s important is that you keep that up every week. Your warfarin levels will most likely go up and down if you suddenly stop eating a lot of vitamin K-rich foods or if you suddenly start.

The goal is to have a consistent level of vitamin K and a therapeutic INR.



Bleeding

VKA at 8 PM

INR at 8AM

Doctor

Table 5—Recommendations for Managing Elevated INRs or Bleeding in Patients Receiving VKAs (Section 2.4)*

Condition†	Intervention
INR more than therapeutic range but < 5.0; no significant bleeding	Lower dose or omit dose; monitor more frequently and resume at lower dose when INR therapeutic; if only minimally above therapeutic range, no dose reduction may be required (Grade 1C).
INR \geq 5.0, but < 9.0; no significant bleeding	Omit next one or two doses, monitor more frequently, and resume at an appropriately adjusted dose when INR in therapeutic range. Alternatively, omit dose and give vitamin K (1–2.5 mg po), particularly if at increased risk of bleeding (Grade 1C). If more rapid reversal is required because the patient requires urgent surgery, vitamin K (\leq 5 mg po) can be given with the expectation that a reduction of the INR will occur in 24 h. If the INR is still high, additional vitamin K (1–2 mg po) can be given (Grade 2C).
INR \geq 9.0; no significant bleeding	Hold warfarin therapy and give higher dose of vitamin K (2.5–5 mg po) with the expectation that the INR will be reduced substantially in 24–48 h (Grade 1B). Monitor more frequently and use additional vitamin K if necessary. Resume therapy at an appropriately adjusted dose when INR is therapeutic.
Serious bleeding at any elevation of INR	Hold warfarin therapy and give vitamin K (10 mg by slow IV infusion), supplemented with FFP, PCC, or rVIIa, depending on the urgency of the situation; vitamin K can be repeated q12h (Grade 1C).
Life-threatening bleeding	Hold warfarin therapy and give FFP, PCC, or rVIIa supplemented with vitamin K (10 mg by slow IV infusion). Repeat, if necessary, depending on INR (Grade 1C).
Administration of vitamin K	In patients with mild to moderately elevated INRs without major bleeding, give vitamin K orally rather than subcutaneously (Grade 1A).

Self-monitoring

Some people may be able to do this testing at home after they've received thorough training — this is called 'self-monitoring'. In order to do self-monitoring, you will need to have your tests as often as your doctor tells you to, and be diligent with following the special [lifestyle instructions](#) that are advised when taking warfarin. Most people will still need to contact your doctor to report your INR and to check if your warfarin dose needs to be changed.

Speak to your doctor to work out the best monitoring option for you.

Note: Portable monitoring devices and the replacement strips are not covered by Medicare — you would need to cover the cost yourself. If you have private health insurance, your plan may cover it. You can check this with your insurance provider.

Bleeding

Lawsuit

Education

Self monitoring

Self adjustment



Better outcomes

