

	Intrinsic Pathway	Extrinsic Pathway
Other name – indicates initiation	Contact Activation Pathway	Tissue Factor pathway
Triggers	Blood contacts damaged endothelial layer of blood vessel walls. (No tissue damage)	Release of biochemicals from broken blood vessels/damaged tissue.
Initiation	▶ It occurs when Prokallikrein (PK), high MW Kininogen (HMWK), factor XI, and factor XII ‘12’ (Hageman factor) are exposed to a negatively charged surface (such as collagen, PLs, Circulating lipoprotein particles, or on the surface of bacteria) ▶ This is termed as contact phase	▶ It is initiated by the release of tissue thromboplastin (Factor III ‘3’) which is exposed to the blood when there is damage to the blood vessel. ▶ Factor VII ‘7’ then forms a complex with tissue thromboplastin and Ca^{2+}.
Factors involved	XII(12) , XI (11) , IX (9) ,VIII(8) , X (10)	III (3) ,VII (7) , X (10)
To easily remember which clotting factor goes where:	Starting with factor 12: 1. Split 12 into two numbers; 1 and 2. 2. First, minus 1 to get from 12 to factor 11. 3. Then, minus 2 to get from 11 to factor 9. 4. In order for factor 9 to activate factor 10, there needs to be factor 8 present (so, you need 8 to get to 9 to activate 10) ↓	1. Split the 12 from intrinsic pathway again into two numbers; 1 and 2. 2. Add them together so that $1+2 =$ factor 3. 3. In order to get to 10, you need 7 more (factor 7). ↓

Both pathways lead to factor 10, which is the start of the **Common Pathway:**

- ▶ **Factor 10** catalyzes the prothrombin (**Factor 2**) to thrombin reaction.
- ▶ The activation of prothrombin occurs on the surface of activated platelets and requires assembly of **prothrombinase complex** consisting of **platelet, anionic PLs, Ca^{2+} , factor 10 and prothrombin (This complex is termed factor 5)**
- ▶ Factor 2 then converts fibrinogen (**Factor 1**) to fibrin.
- ▶ In order for fibrin to stick to each other, there needs to be **factor 13** and Ca^{2+}

(Think of factor 13 being the final clotting number and therefore the final step to the clotting process!)

Key points to remember:

- ▶ Vitamin K is essential for the functioning of several proteins involved in blood clotting (2, 7, 9 and 10)
- ▶ Calcium is required to continue the clotting cascade along with factors (2, 9, 10, and 11).
- ▶ Roman numerals are simplified as in the following table:

I	V	X
1	5	10

1	I	1
2	II	1+1=2
3	III	1+1+1=3
4	IV	5-1=4
5	V	5
6	VI	5+1=6
7	VII	5+1+1=7
8	VIII	5+1+1+1=8
9	IX	10-1=9
10	X	10

11	XI	10+1=11
12	XII	10+1+1=12
13	XIII	10+1+1+1=13