Gestione della terapia anticoagulante nel paziente piastrinopenico

FULVIO POMERO
Ospedale Michele e Pietro Ferrero
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Il sottoscritto Fulvio Pomero
ai sensi dell'art. 3.3 sul Conflitto di Interessi, pag. 17 del Reg. Applicativo dell'Accordo Stato-Regione del 5 novembre 2009,

dichiara

che negli ultimi due anni NON ha avuto rapporti diretti di finanziamento con soggetti portatori di interessi commerciali in campo sanitario

Gestione della terapia anticoagulante nel paziente piastrinopenico

Livelli di evidenza	
Livello di evidenza A	Dati derivati da numerosi trial clinici randomizzati o metanalisi
Livello di evidenza B	Dati derivati da un singolo trial clinico randomizzato o da ampi studi non randomizzati
Livello di evidenza C	Consenso degli esperti e/o studi di piccole dimensioni, studi retrospettivi, registri

ORIGINAL ARTICLE | ARCHIVE

The Quantitative Relation between Platelet Count and Hemorrhage in Patients with Acute Leukemia

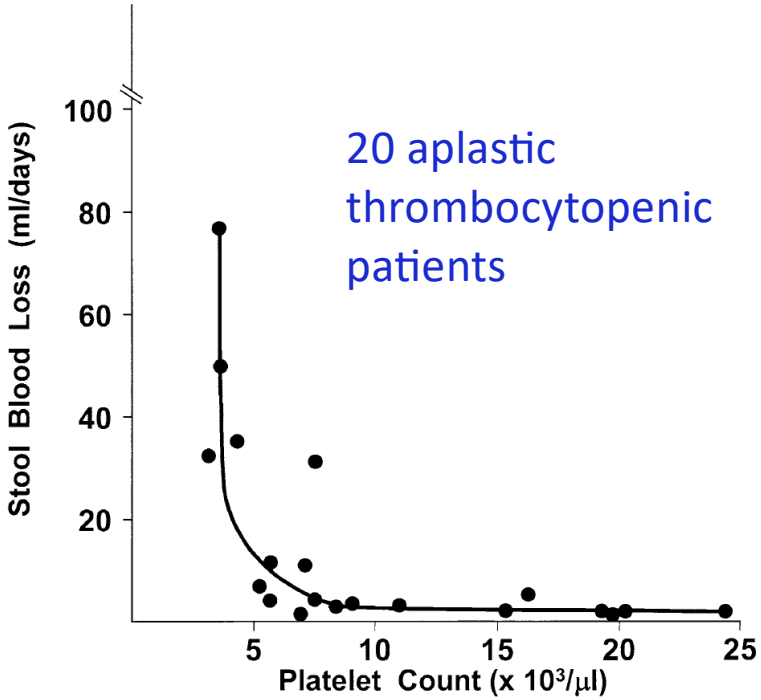
Authors: Lawrence A. Gaydos, M.D., Emil J. Freireich, M.D., and Nathan Mantel, M.A. Author Info & Affiliations

Published May 3, 1962 | N Engl J Med 1962;266:905-909 | DOI: 10.1056/NEJM196205032661802
VOL. 266 NO. 18

Gaydos et al. analyzed the records of 92 consecutive patients with acute leukemia from the National Cancer Institute and noted that gross bleeding occurred on 33% of days in patients with platelet counts $<1 \times 10^9/L$ and on 3% of days in those with counts between $5–20 \times 10^9/L$.

Gaydos LA et al. NEJM 266; 1962: 905-909

Relationship Between Platelet Count and Bleeding Risk in Thrombocytopenic Patients



20 aplastic thrombocytopenic patients

Shilkter SJ . Transfusion Medicine Reviews, 2004: 153-167

Anticoagulant & thrombocytopenia

Most frequent clinical scenarios

- ✓ Cancer
- ✓ Advanced liver disease
- ✓ Sepsis
- ✓ ……..

VTE & Cancer

RCT

CARAVAGGIO : exclusion criteria PTLS < 75,000/mm3

Platelet count <100,000/mm3 — no. (%)	Apixaban	21 (3.6%)
	Dalteparine	22 (3.8%)

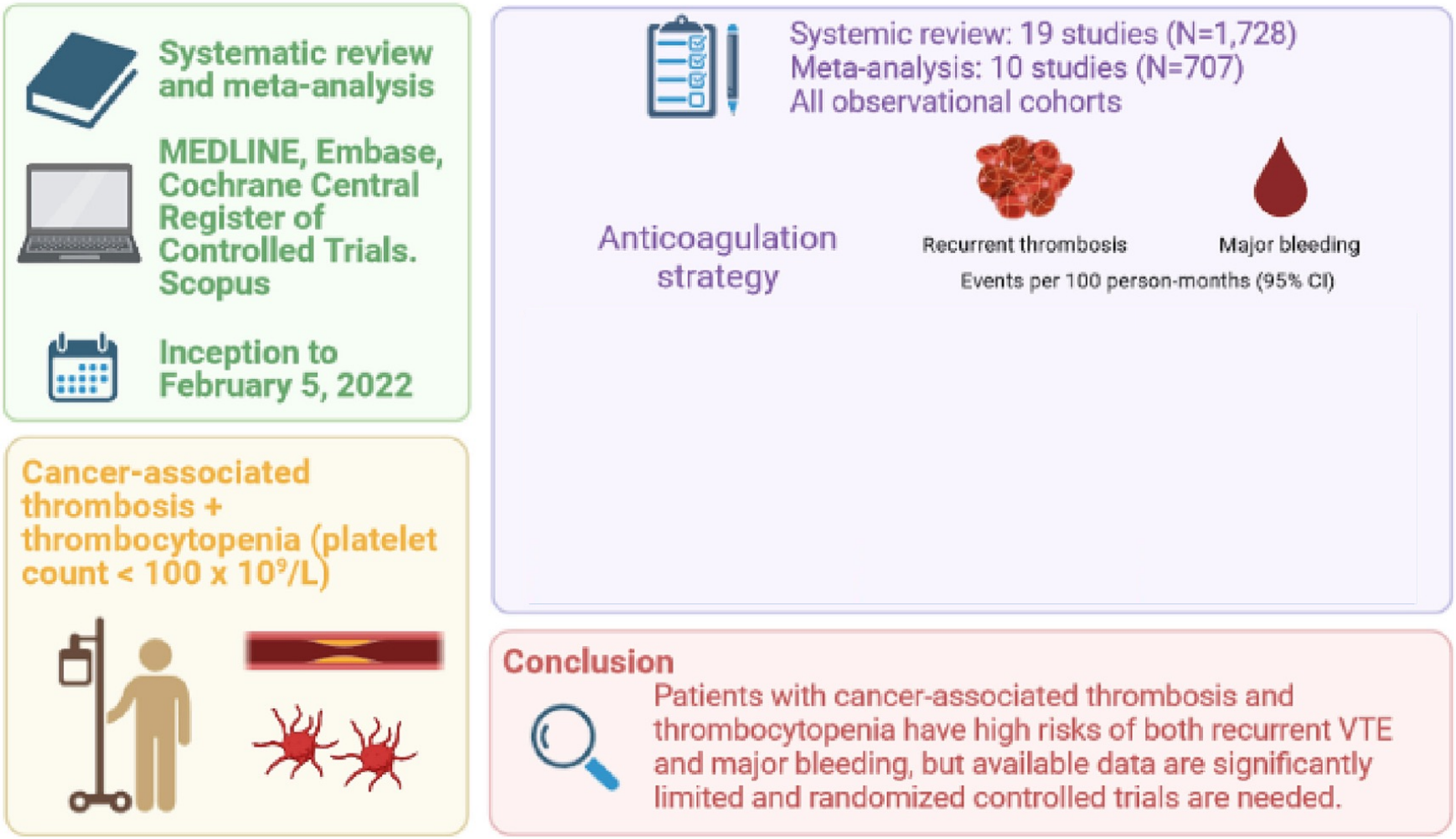
HOKUSAI VTE CANCER: exlusion criteria PTLS < 50,000/mm3

Platelet count <100,000/mm3 — no. (%)	Edoxaban	32 (6.1%)
	Dalteparine	23 (4.4%)

CANVAS: exlusion criteria PTLS < 50,000/mm3

Platelet count <100,000/mm3 — no. (%)	DOACs	41 (12%)
	LMWH	47 (15%)

Anticoagulation management and related outcomes in patients with cancer-associated thrombosis and thrombocytopenia: A systematic review and meta-analysis



Wang TF et al. Thrombosis Research 227 (2023) 8–16

Management and outcomes of cancer patients with venous thromboembolism presenting with thrombocytopenia

RIETE registry

Clinical characteristics according to platelet count at baseline.

	Severe thrombocytopenia		Mild thrombocytopenia	Normal platelet count
	< 20,000/μL	20–49,000/μL	50–99,000/μL	≥100,000/μL
Patients, N	28	138	711	14,460
Clinical characteristics				
Male gender	12 (43%)	80 (58%)	420 (59%)‡	7650 (53%)
Age (mean years ± SD)	58 ± 14†	64 ± 13†	66 ± 12*	67 ± 13
Body weight (mean kg ± SD)	72 ± 14	72 ± 15	72 ± 14	72 ± 14
Initial VTE presentation				
Deep vein thrombosis	21 (75%)†	72 (52%)	352 (50%)	6627 (46%)
Distal DVT	1 (3.6%)	4 (2.9%)	52 (7.3%)	2062 (14%)
Pulmonary embolism	7 (25%)†	66 (48%)	359 (51%)	7833 (54%)

Lecumberri R et al. Thrombosis Research 195 (2020) 139–145

Management and outcomes of cancer patients with venous thromboembolism presenting with thrombocytopenia

RIETE registry

Treatment strategies.

	Severe thrombocytopenia		Mild thrombocytopenia	Normal platelet count
	< 20,000/μL	20–49,000/μL	50–99,000/μL	≥100,000/μL
Patients, N	28	138	711	14,460
Days of treatment (median, IQR)	58 (14–144)	64 (16–134)‡	109 (39–203)‡	137 (84–256)
Initial therapy,				
Unfractionated heparin	1 (3.6%)	14 (10%)	46 (6.5%)	703 (4.9%)
Low-molecular-weight heparin	21 (75%)	109 (79%)*	620 (87%)‡	13,140 (91%)
Mean LMWH dose (IU/kg/day)	95 ± 56‡	130 ± 62‡	163 ± 48‡	172 ± 44
LMWH < 100 IU/kg/day	15 (71%)‡	40 (37%)‡	69 (11%)‡	885 (6.7%)
LMWH 100–150 IU/kg/day	2 (1.0%)	24 (22%)	145 (23%)†	2509 (19%)
LMWH > 150 IU/kg/day	4 (19%)‡	45 (41%)‡	406 (65%)‡	9730 (74%)
Fondaparinux	0	3 (2.2%)	20 (2.8%)‡	166 (1.1%)

Lecumberri R et al. Thrombosis Research 195 (2020) 139–145

Management and outcomes of cancer patients with venous thromboembolism presenting with thrombocytopenia

RIETE registry

Multivariate analyses at 10- and at 30 days.

major bleeding

	10-day outcomes	30-day outcomes
Major bleeding		
Anemia	1.85 (1.34–2.56)‡	1.85 (1.43–2.38)‡
Leukocyte count > 11,000/μL	2.04 (1.55–2.70)‡	1.67 (1.34–2.09)‡
Platelet count		
≥100,000/μL	1 (Ref.)*	1 (Ref.)‡
50–99,000/μL	2.07 (1.25–3.40)†	2.12 (1.44–3.12)‡
< 50,000/μL	0.83 (0.20–3.41)	1.07 (0.39–2.94)
CrCl levels < 60 mL/min	1.43 (1.09–1.89)*	1.69 (1.36–2.11)‡
Recent major bleeding	4.11 (2.74–6.16)‡	3.35 (2.37–4.74)‡
Recent immobility	1.40 (1.03–1.91)*	1.37 (1.08–1.75)*
No treatment for cancer	1.69 (1.27–2.26)‡	1.56 (1.23–1.96)‡

death

	10-day outcomes	30-day outcomes
Death		
Age	1.01 (1.00–1.02)*	1.01 (1.01–1.02)‡
Anemia	1.35 (1.12–1.64)†	1.56 (1.38–1.78)‡
Leukocyte count > 11,000/μL	2.81 (2.36–3.34)‡	2.95 (2.63–3.32)‡
Platelet count		
≥100,000/μL	1 (Ref.)‡	1 (Ref.)‡
50–99,000/μL	2.83 (2.11–3.78)‡	2.23 (1.79–2.79)‡
< 50,000/μL	4.03 (2.39–6.79)‡	4.49 (3.05–6.63)‡
CrCl levels < 60 mL/min	1.88 (1.54–2.30)‡	1.57 (1.37–1.79)‡
Recent surgery	–	0.60 (0.48–0.74)‡
Recent immobility	2.67 (2.0[illegible]	[illegible]1–2.71)‡
Site o[illegible]		
Breast		
Pancre[illegible]		-3.77)‡
Lung		-3.04)‡
Hemat[illegible]		-1.79)
Cerebra[illegible]		2.90)†
Gastroi[illegible]		1.89)†
Genitou[illegible]		1.25 (0.97–1.61)
Other	1.58 (1.09–2.28)*	2.08 (1.59–2.71)‡
Metastases	2.70 (2.18–3.34)‡	3.06 (2.64–3.55)‡
Initial presentation as PE	1.80 (1.50–2.16)‡	1.44 (1.28–1.62)‡
Year of VTE diagnosis		
2001 to 2005	1 (Ref.)‡	1 (Ref.)‡
2006 to 2010	0.94 (0.75–1.18)	0.96 (0.82–1.12)
2011 to 2015	0.57 (0.45–0.73)‡	0.71 (0.60–0.83)‡
2016 to 2019	0.61 (0.46–0.82)‡	0.70 (0.57–0.85)‡

The 30-day case-fatality rate of major bleeding in patients with severe thrombocytopenia (PTLS < 50000/mm3) was higher than in patients with normal platelet count

(75% vs 18%).

Lecumberri R et al. Thrombosis Research 195 (2020) 139–145

Current management of cancer-associated venous thromboembolism in patients with thrombocytopenia: a retrospective cohort study

Predictors of LMWH full therapeutic dose

(194 patients)

Mild: 100.000-150.000/mm^3
Moderate: 50.000-100.000/mm^3
Severe: <50.000/mm^3

		Multivariate analysis	
	n/ev	OR	CI 95%
Thrombocytopenia			
Mild	121/101	1.0	Ref
Moderate	51/34	0.30	0.12; 0.75
Severe	22/2	0.014	0.003; 0.083
Age (years)			
< 65	86/56	1.0	Ref
≥ 65	108/81	0.86	0.39–1.89
Metastasis			
No	103/71	1.0	Ref
Cerebral	16/8	**0.06**	**0.01; 0.3**
Other than cerebral	75/58	0.50	0.18; 1.38
Ongoing chemotherapy			
No	65/46	1.0	Ref
Yes	129/91	0.85	0.36; 1.98
Type of cancer			
Solid	143/108	1.0	Ref
Haematologic	51/29	0.39	0.13; 1.15
VTE index event			
No PE	122/78	1.0	Ref
PE	72/59	**2.76**	**1.09; 6.94**
Symptomatic VTE			
No	50/27	**1.0**	**Ref**
Yes	144/110	**4.46**	**1.85–10.8**

Squizzato A et al. Internal and Emergency Medicine (2022) 17:83–90

Current management of cancer-associated venous thromboembolism in patients with thrombocytopenia: a retrospective cohort study

Outcomes during 3-month follow-up according to platelets count

3-months outcomes	Thrombocytopenia		
	≥ 75,000/ mm3 ($n = 125$)	< 75,000/ mm^3 ($n = 46$)	≥ 75,000/mm^3 vs < 75,000/ mm^3
Major bleeding	4 (3.2)	1 (2.2)	0.99
Minor bleeding	7 (5.6)	2 (4.4)	0.99
CRNMB	5 (4.0)	0 (0.0)	0.32
VTE recurrence	7 (5.6)	1 (2.2)	0.68
Death	12 (9.6)	15 (32.6)	0.0006
No Outcomes	84 (67.2)	27 (58.7)	
Missing	6 (4.8)	0 (0.0)	

Squizzato A et al. Internal and Emergency Medicine (2022) 17:83–90

ISTH
International Society on Thrombosis and Haemostasis

Management of cancer-associated thrombosis in patients with thrombocytopenia: guidance from the SSC of the ISTH

1. We recommend giving full therapeutic anticoagulation without platelet transfusion to patients with CAT and a platelet count of $\geq 50 \times 10^9\ L^{-1}$.

Carrier M et al. JTH 2018: 1246-9

Management of cancer-associated thrombosis in patients with thrombocytopenia: guidance from the SSC of the ISTH

2. For patients with acute CAT and severe thrombocytopenia ($< 50 \times 10^9$ L^{-1}) and *a higher risk of thrombus progression, we suggest full-dose anticoagulation (LMWH/UFH) with platelet transfusion support to maintain a platelet count of* $\geq 40–50 \times 10^9$ L^{-1}.
3. For patients with acute CAT and severe thrombocytopenia ($< 50 \times 10^9$ L^{-1}) and *a lower risk of thrombus progression:*
   a. We suggest reducing the dose of LMWH to 50% of the therapeutic dose or using a prophylactic dose of LMWH in patients with a platelet count of 25–50×10^9 L^{-1}.
   b. We suggest temporarily discontinuing anticoagulation in patients while the platelet count is $< 25 \times 10^9$ L^{-1}.
   c. We recommend resuming full-dose LMWH when the platelet count is $> 50 \times 10^9$ L^{-1} without transfusion support, in the absence of other contraindications.
4. For subacute or chronic CAT (> 30 days since the index VTE) and thrombocytopenia ($< 50 \times 10^9$ L^{-1}):
   a. We suggest reducing the dose of LMWH to 50% of the therapeutic dose or using a prophylactic dose of LMWH in patients with a platelet count of 25–50×10^9 L^{-1}.
   b. We suggest temporarily discontinuing anticoagulation in patients while the platelet count is $< 25 \times 10^9$ L^{-1}.
   c. We suggest resuming full-dose LMWH, as indicated, when the platelet count is $> 50 \times 10^9$ L^{-1} without transfusion support.

Carrier M et al. JTH 2018: 1246-9

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Management of cancer-associated thrombosis in patients with thrombocytopenia: guidance from the SSC of the ISTH

Inferior vena cava filters

Another important issue is the appropriate use of inferior vena cava (IVC) filters in this patient population. A recent trial has shown that the use of retrievable IVC filters in combination with anticoagulation in patients with PE did not reduce the risk of recurrent symptomatic events [27,28]. Similar findings were also reported in patients with CAT [29]. Therefore, IVC filter insertion should be considered only in patients with absolute contraindications to anticoagulation [30]. Therefore, retrievable IVC filters may be considered on a case-by-case basis in patients with acute VTE who are actively bleeding or have severe, prolonged thrombocytopenia for which anticoagulation with platelet transfusion cannot be achieved. The retrievable IVC filters should be removed as soon as anticoagulation can be resumed.

Carrier M et al. JTH 2018: 1246-9

TROMBOEMBOLISMO VENOSO NEI PAZIENTI CON TUMORI SOLIDI

Linea guida pubblicata nel Sistema Nazionale Linee Guida

Edizione 2024

AIOM ASSOCIAZIONE ITALIANA ONCOLOGIA MEDICA

5.1.1 Terapia del tromboembolismo venoso acuto in pazienti oncologici con trombocitopenia

Sulla base di pochi dati provenienti da analisi retrospettive e case-series, viene generalmente suggerita una terapia anticoagulante a **dosi piene** per valori di conta piastrinica superiori a **50 x 10^9/L**

Linea guida pubblicata nel Sistema Nazionale Linee Guida

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< 1° mese di terapia	**Alto rischio TEV**	- TVP prossimale - EP lobare/segmentaria	EBPM dose piena + trasfusioni di PTLS (goal: **40-50** x 10^9/L)
	Basso rischio TEV	- TVP distale - EP subsegmentaria isolata	EBPM - dosi profilattiche - dosi intermedie
> 1° mese di terapia	PTLS **25-50** x 10^9/L		EBPM - dosi profilattiche - dosi intermedie
	PTLS < **25** x 10^9/L		Considerare STOP EBPM

ISTH 2024 CONGRESS | Bangkok | 22-26 giugno 2024

Cancer associated thrombosis - Treatment and complications

Abs OC 32.5

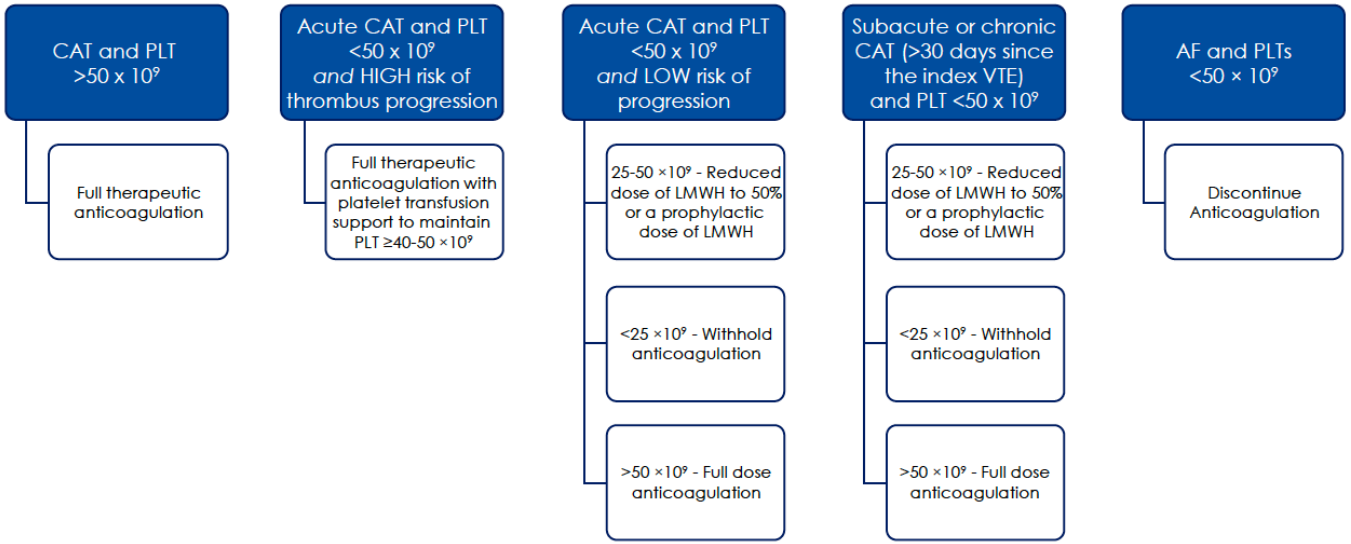
Interim analysis of the Prospective Cohort Study on Patients with a Haematological Malignancy on Anticoagulants who develop Thrombocytopaenia (HAT Study)

Presenter: Marcus P. Lombard

HAT Study

- Questo studio osservazionale prospettico ha incluso pazienti adulti (>18 anni) con neoplasie ematologiche in trattamento anticoagulante che hanno sviluppato trombocitopenia (<100 x10^9/L).
- Il protocollo di aggiustamento della dose di anticoagulanti è stato basato sulle linee guida ISTH e ESC.

ISTH Guideline treatment of CAT (2018) & ESC Atrial Fibrillation (2022)

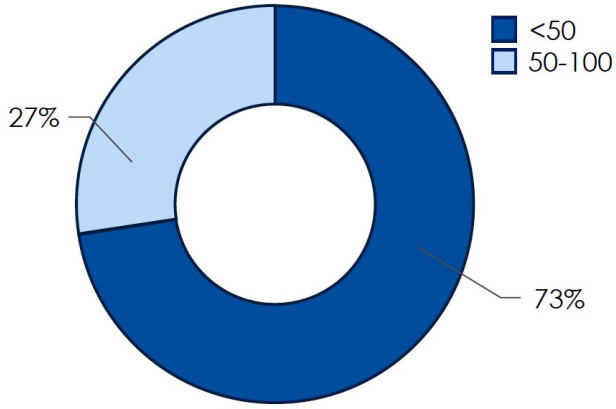


Outcome primari: tassi di TEV sintomatico, tromboembolia arteriosa, sanguinamento maggiore e sanguinamento clinicamente rilevante non maggiore (CRNMB).

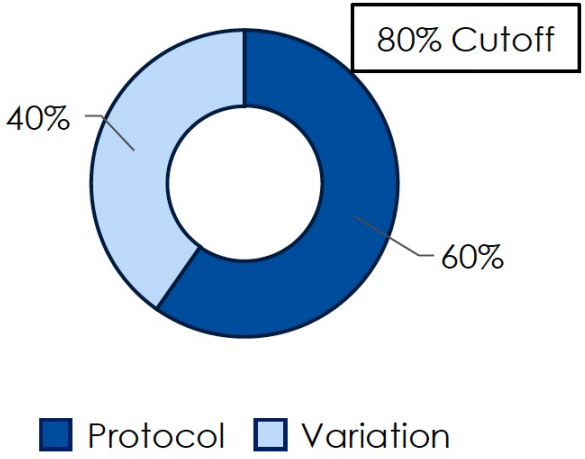
HAT Study

Results

Severity of Thrombocytopenia



Protocol Followed N=52



	Protocol (N=31)	Variation (N=21)
Major Bleeding	2 (6%)	2 (10%)
Clinically Relevant NMB	2 (6%)	3 (14%)
Venous Thrombosis	1 (3%)	1 (5%)
Arterial Thrombosis	0 (0%)	1 (5%)

Anticoagulant & thrombocytopenia

Most frequent clinical scenarios

- ✓ Cancer
- ✓ **Advanced liver disease**
- ✓ Sepsis
- ✓ ……..

Hematological abnormalities in liver cirrhosis

Abnormal hematological indices in patients with compensated cirrhosis

Anemia	Leukopenia	Thrombocytopenia
Prevalence 21.1%	**Prevalence 23.5%**	**Prevalence 77.9%**
• Portal hypertension-induced splenic sequestration • Alterations in erythropoietin • Bone marrow suppression mediated by toxins (alcohol, viral, hepatitis) • Increased blood loss (bleeding, hemolysis)	• Portal hypertension-induced splenic and splanchnic sequestration • Alterations in granulocyte-colony stimulating factor and granulocyte macrophage-colony stimulating factor • Bone marrow suppression mediated by toxins (alcohol, viral, hepatitis) • Increased blood loss (bleeding, hemolysis)	• Portal hypertension-induced splenic sequestration • Alterations in thrombopoietin • Bone marrow suppression mediated by toxins (alcohol, viral, hepatitis) • Consumptive coagulopathy • Increased blood loss (bleeding)

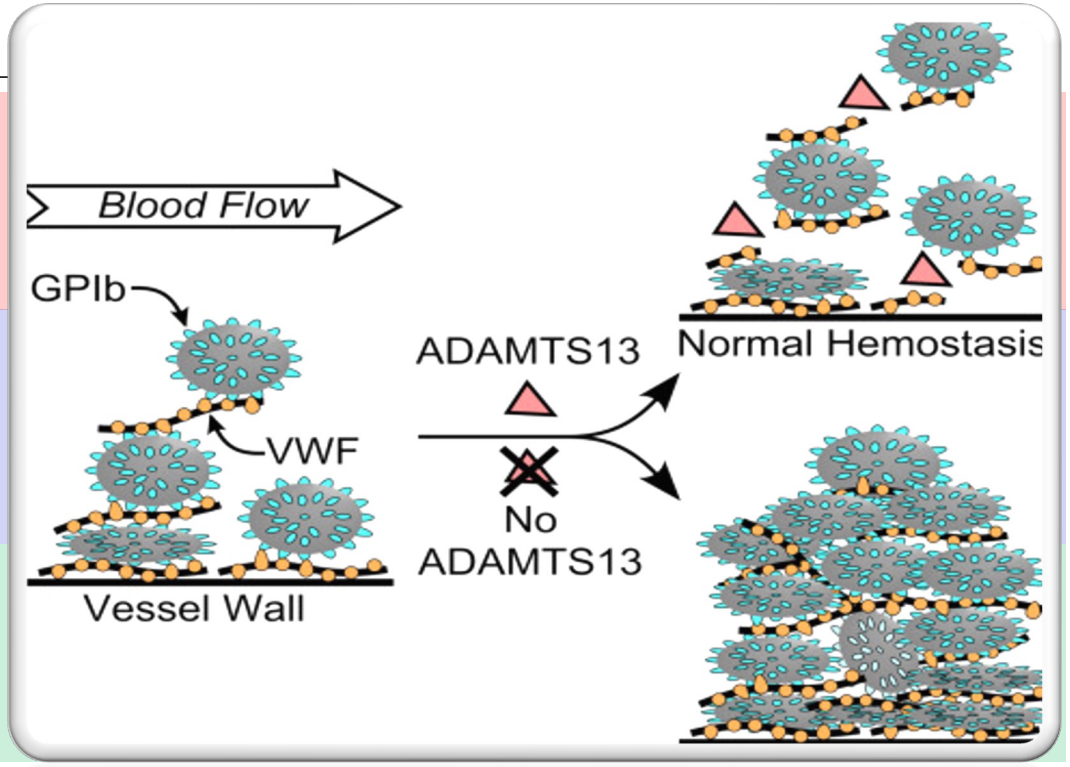
Fierro Angulo OM et al. World J Hepatol 2024 September 27; 16(9): 1229-1244

Vascular Liver Disorders, Portal Vein Thrombosis, and Procedural Bleeding in Patients With Liver Disease: 2020 Practice Guidance by the American Association for the Study of Liver Diseases

AASLD
AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES

Rebalance of Hemostasis System Components in Cirrhosis

	Platelets
Changes promoting bleeding	• Thrombocytopenia • Platelet function defects • Anemia (less platelet margination when hematocrit is low)
Changes promoting clotting	• Elevated levels of VWF • Decreased levels of ADAMTS13 • Enhanced *in vivo* platelet activation • Activated endothelium
Net effect	Poorly studied; elevated VWF compensates at least partly for thrombocytopenia



Northup et al. Hepatology, VOL . 73, NO. 1, 2021

Vascular Liver Disorders, Portal Vein Thrombosis, and Procedural Bleeding in Patients With Liver Disease: 2020 Practice Guidance by the American Association for the Study of Liver Diseases

AASLD
AMERICAN ASSOCIATION FOR THE STUDY OF LIVER DISEASES

Recommendations for Minimum Threshold Values of Common Coagulation and Bleeding Parameters in Patients With Cirrhosis Before Invasive Procedures With a High Risk of Bleeding

Organization	Platelet Count (× 1,000/μL)	INR	Fibrinogen Level (mg/dL)
AASLD (this document)	No routine preprocedure correction	No routine preprocedure correction	No routine preprocedure correction
Society of Interventional Radiology 2019[28]	>30	<2.5*	>100
American Gastroenterological Association 2019[81]	>50	No correction	>120
American College of Gastroenterology 2020[3]	>50	No correction	>120-150

Northup et al. Hepatology, VOL . 73, NO. 1, 2021

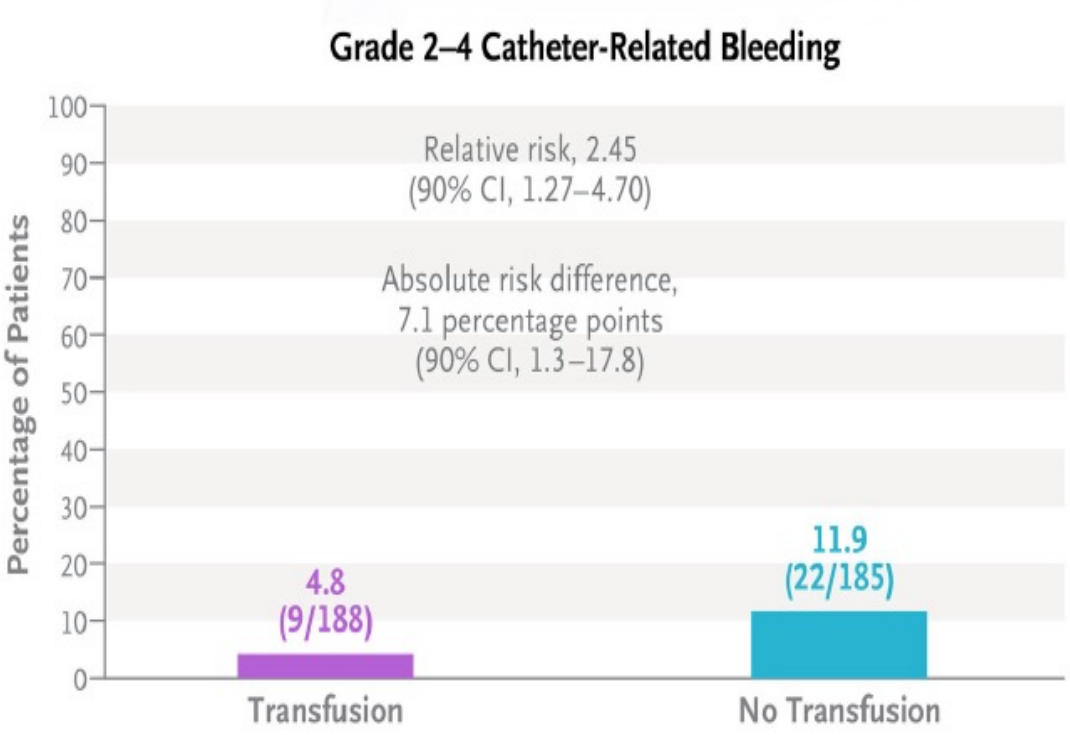
Platelet Transfusion before CVC Placement in Patients with Thrombocytopenia

noninferiority trial

Patients with severe thrombocytopenia (10.000 to 50,000/mm3).
Hematology ward or intensive care unit
- receive either one unit of **prophylactic platelet transfusion or no platelet transfusion** before ultrasound-guided CVC placement.

Table 1. CVC-Related Bleeding.*

Bleeding Grade	Definition
Grade 0	No bleeding
Grade 1	Oozing; hematoma; bleeding that results in <20 min of manual compression to stop
Grade 2	Bleeding that results in minor interventions to stop, such as prolonged manual compression (>20 min)
Grade 3	Bleeding that results in radiologic or elective operative intervention or red-cell transfusion without hemodynamic instability
Grade 4	Bleeding associated with severe hemodynamic instability (hypotension, defined as a decrease of >50 mm Hg or >50% in either systolic or diastolic blood pressure), with associated tachycardia (heart rate increase, >20% for 20 min) and resulting in increased red-cell transfusion or fatal bleeding

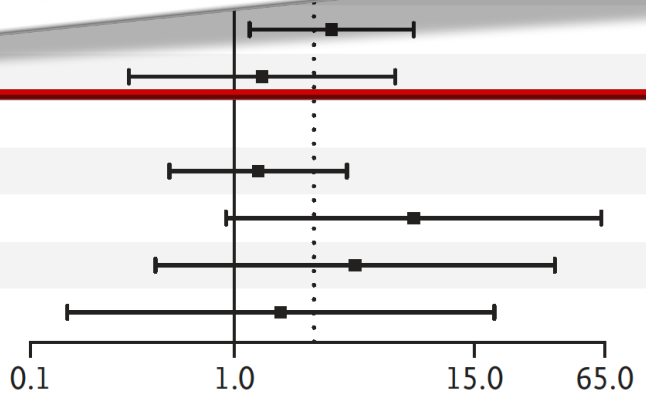


Van Baarle FLF et al. N Engl J Med 2023;388:1956-65

Platelet Transfusion before CVC Placement in Patients with Thrombocytopenia

Despite our overall findings regarding CVC-related bleeding complications in all patients with a platelet count of 10,000 to 50,000 per cubic millimeter, we would advocate for a more personalized approach. We would consider pro-

Subgroup of Bleeding Risk	Transfusion	No Transfusion	
	no. of events/total no. (%)		
Primary analysis			4.70)
Type			
Tun			.34)
Nor			.55)
Insertio			
Inter			79)
Subc			.64)
Femo			52)
Departm			
Hema			2.99 (1.19–7.54)
Intens		4/81 (4.9)	1.36 (0.30–6.11)
Platelet count per mm^3			
10,000–19,000	7/45 (15.6)	9/41 (22.0)	1.30 (0.48–3.55)
20,000–29,000	0/46	8/51 (15.7)	7.53 (0.91–62.50)
30,000–39,000	1/59 (1.7)	3/51 (5.9)	3.90 (0.41–37.05)
40,000–50,000	1/38 (2.6)	2/42 (4.8)	1.68 (0.15–18.68)



Van Baarle FLF et al. N Engl J Med 2023;388:1956-65

Anticoagulant & thrombocytopenia

Most frequent clinical scenarios

- ✓ Cancer
- ✓ Advanced liver disease
- ✓ **Sepsis**
- ✓ ……..

Practical approach to thrombocytopenia in patients with sepsis: a narrative review

Prevalence of thrombocytopenia

Author	Participants	Sepsis	Thrombocytopenia
Claushuis et al. [12]	Adults	929	349 (37.5%)
Ree et al. [13]	Adults	460	226 (49%)
Venkata et al. [14]	Adults	304	145 (47.6%)
Li et al. [15]	Adults	261	127 (48.6%)
Bedet et al. [16]	Adults	60	33 (55%)
Abe et al. [17]	Adults	49	No data
Arif et al. [18]	Neonates	85	71 (83.5%)

Satoh K et al. Thrombosis Journal (2024) 22:67

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

Sequential [Sepsis-Related] Organ Failure Assessment Score (SOFA score)

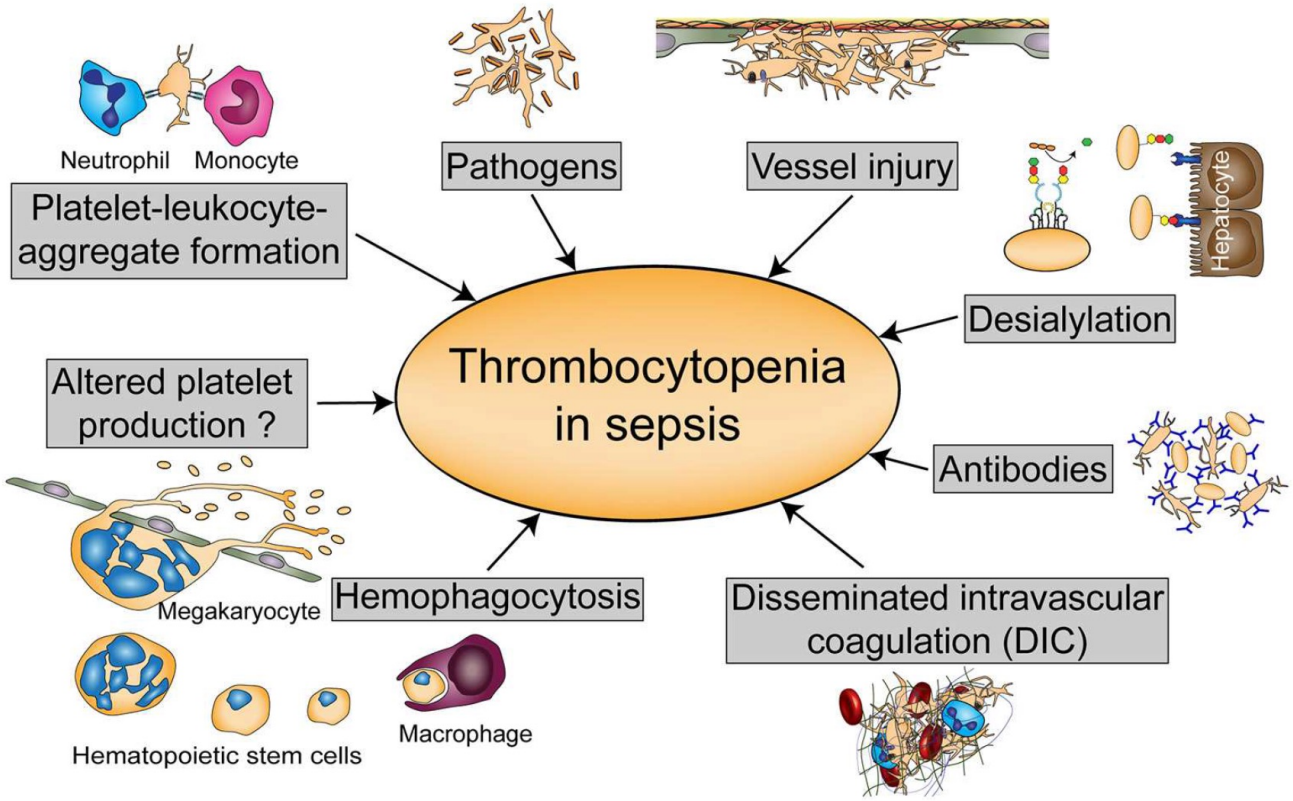
	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine	Dopamine	
Central nervous system					
Glasgow Coma Scale score[c]					
Renal					
Creatinine, mg/dL (μmol/L)				3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

RECOMMENDATIONS Sepsis should be defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. For clinical operationalization, organ dysfunction can be represented by an increase in the Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score of 2 points or more, which is associated with an in-hospital mortality greater than 10%.

Singer et al. JAMA. 2016;315(8):801-810

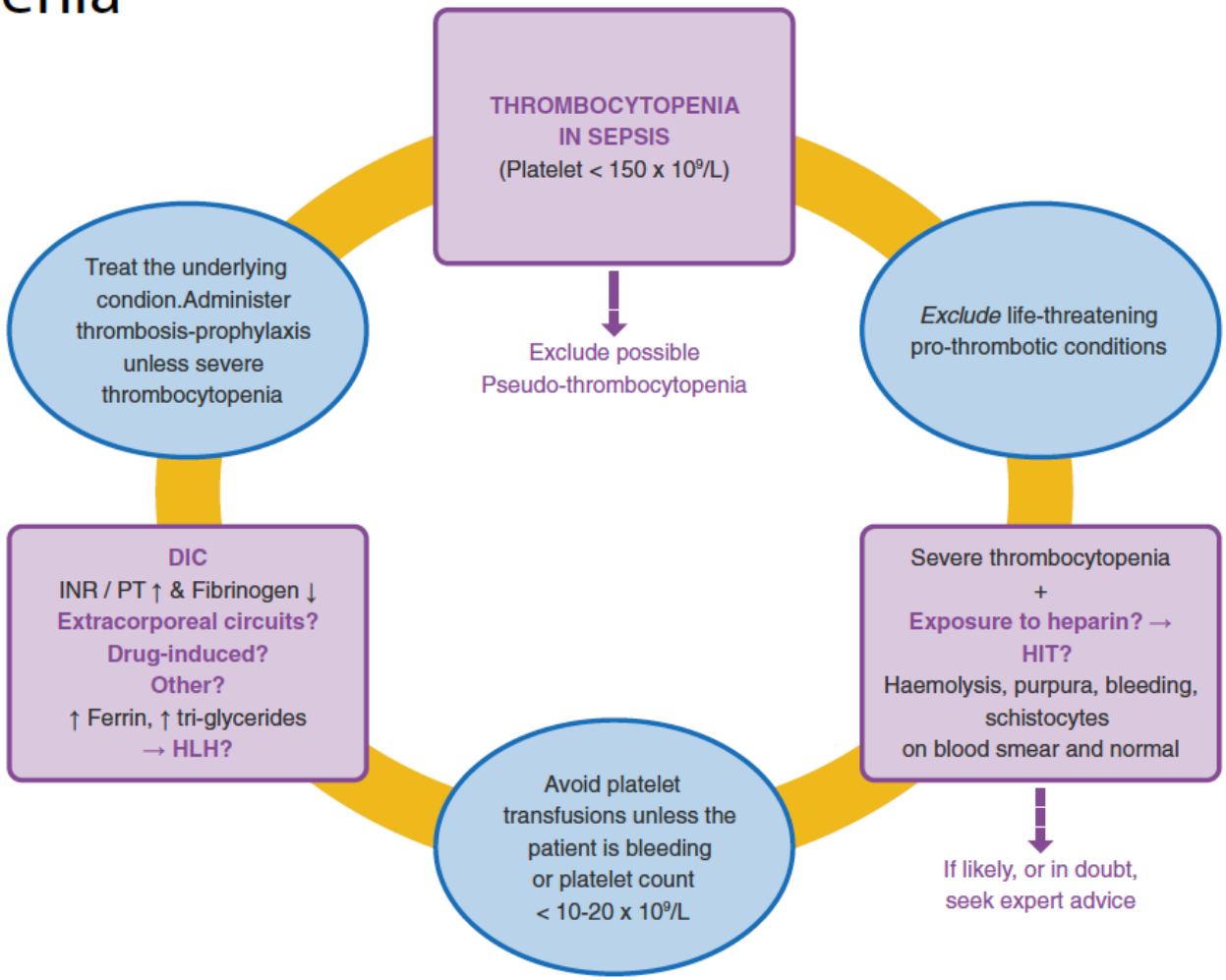
Platelets in Sepsis: An Update on Experimental Models and Clinical Data

Possible causes of thrombocytopenia in sepsis.



Assinger A et al. 2019 Frontier in immunology doi: 10.3389/fimmu.2019.01687

Ten tips on sepsis-induced thrombocytopenia



Leone M et al. Intensive Care Med (2024) 50:1157–1160

Sepsis-Induced Coagulopathy (SIC) Score

Predicts likelihood of sepsis-induced coagulopathy.

INR	≤1.2	0
	>1.2 to 1.4	**+1**
	>1.4	+2
Platelet count, cells x 10^9/L	≥150	0
	100 to <150	+1
	<100	**+2**
Total SOFA score Sum the full SOFA Score's Respiratory, Cardiovascular, Hepatic, and Renal components	0	0
	1	**+1**
	≥2	+2

SIC likely

Diagnosis of SIC

4 points

30% approximate 28-day mortality

ISTH Criteria for Disseminated Intravascular Coagulation (DIC)

Diagnoses overt disseminated intravascular coagulation (DIC).

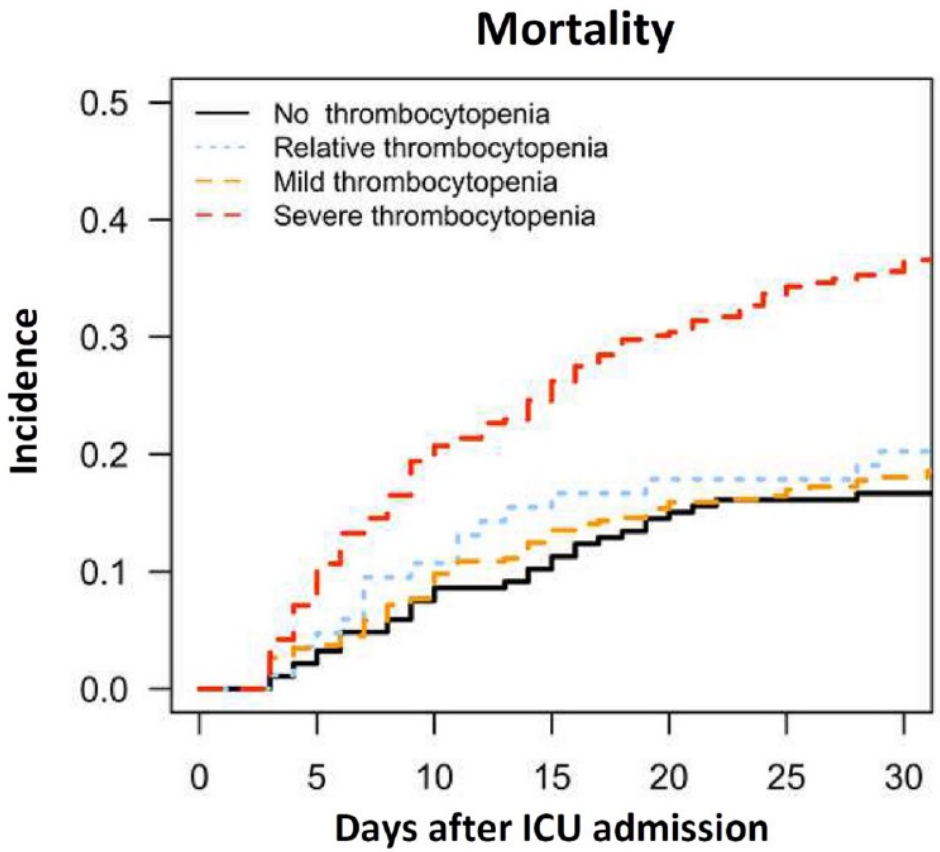
Diagnostic criteria for overt DIC

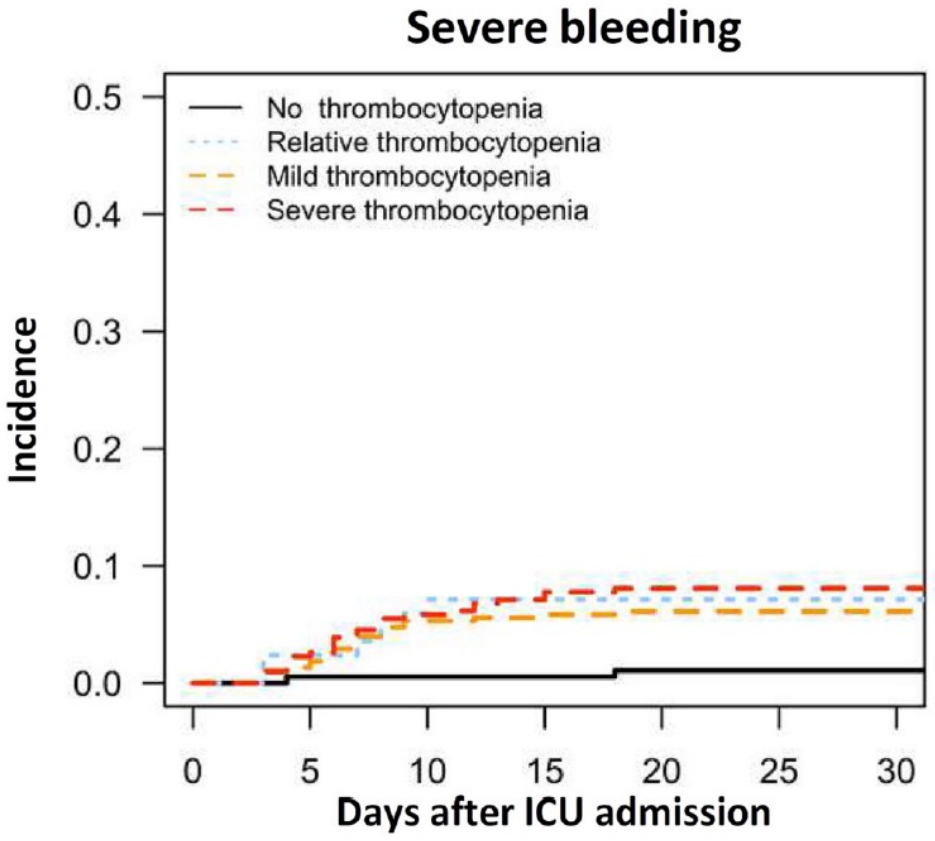
Platelet count, cells x 10^9/L	**≥100**	**0**
	50 to <100	+1
	<50	+2
Elevated levels of a fibrin-related marker (e.g. D-dimer, fibrin degradation products) Use lab-specific cutoff values	**No increase**	**0**
	Moderate increase	+2
	Severe increase	+3
Prolonged PT, seconds	**<3**	**0**
	3 to <6	+1
	≥6	+2
Fibrinogen level, g/L	**≥1**	**0**
	<1	+1

0 points

Not suggestive of overt DIC, may be non-overt DIC; repeat within next 1-2 days and manage clinically as appropriate

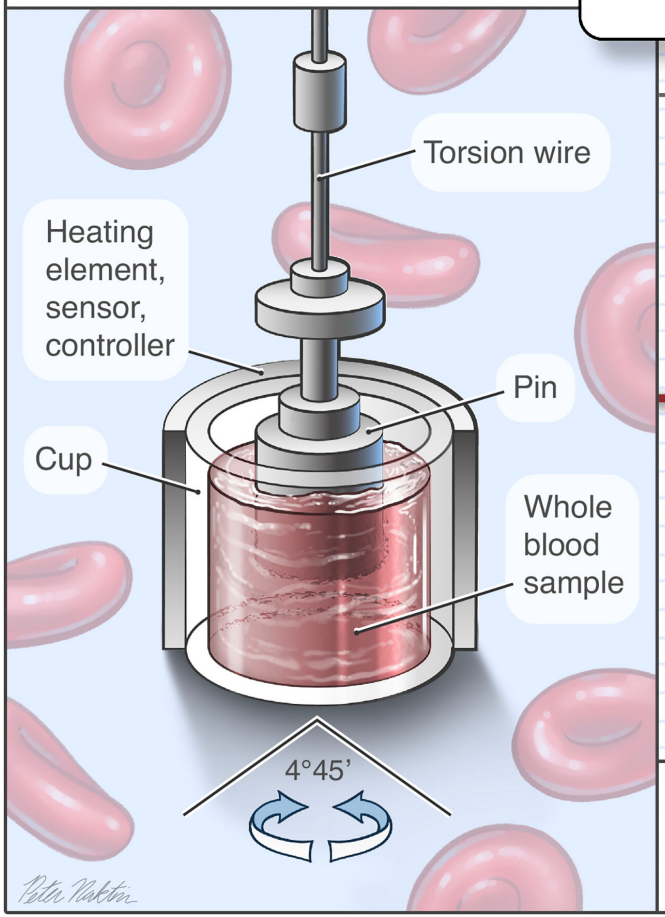
Clinical significance of thrombocytopenia in patients with septic shock: An observational retrospective study

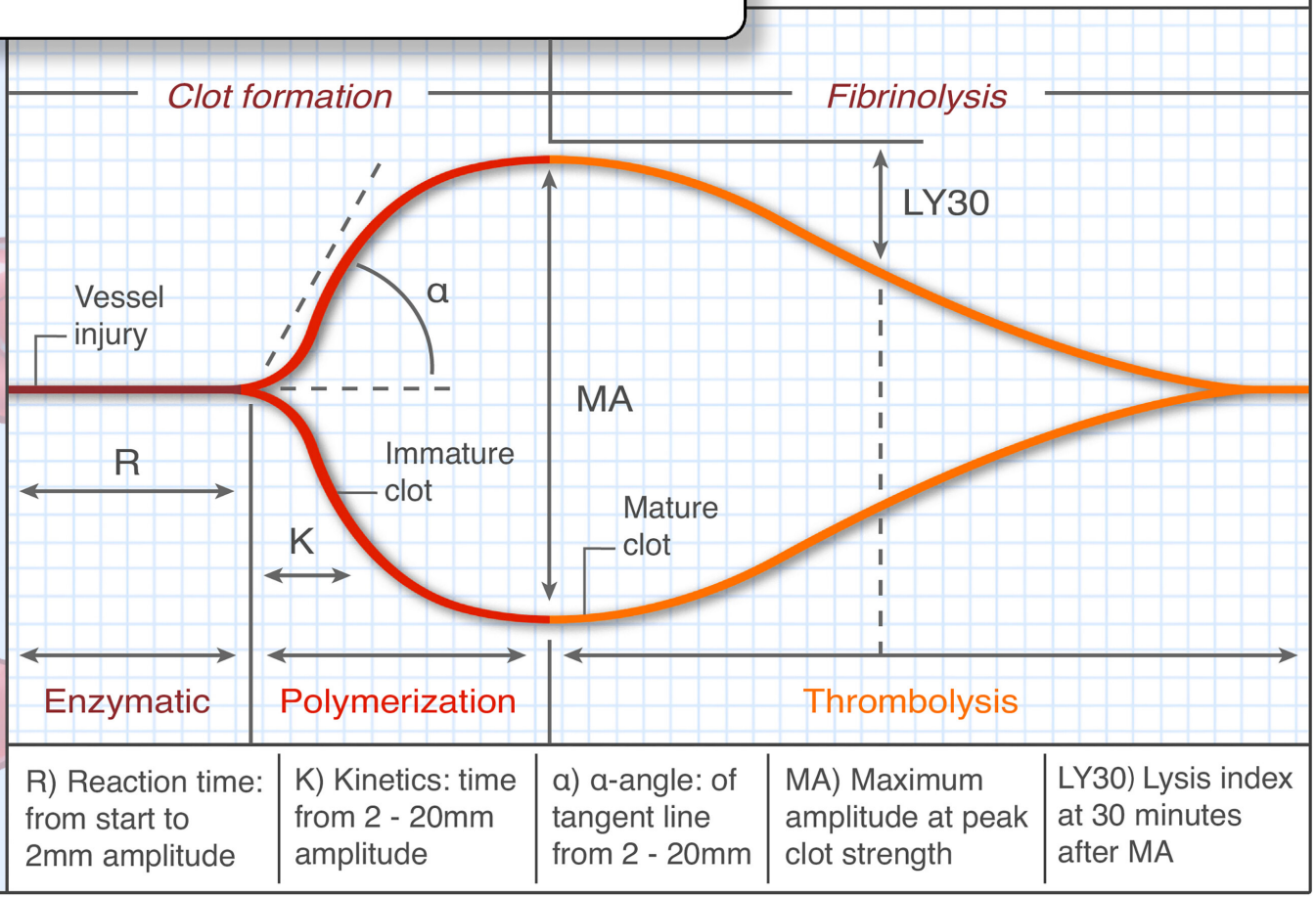




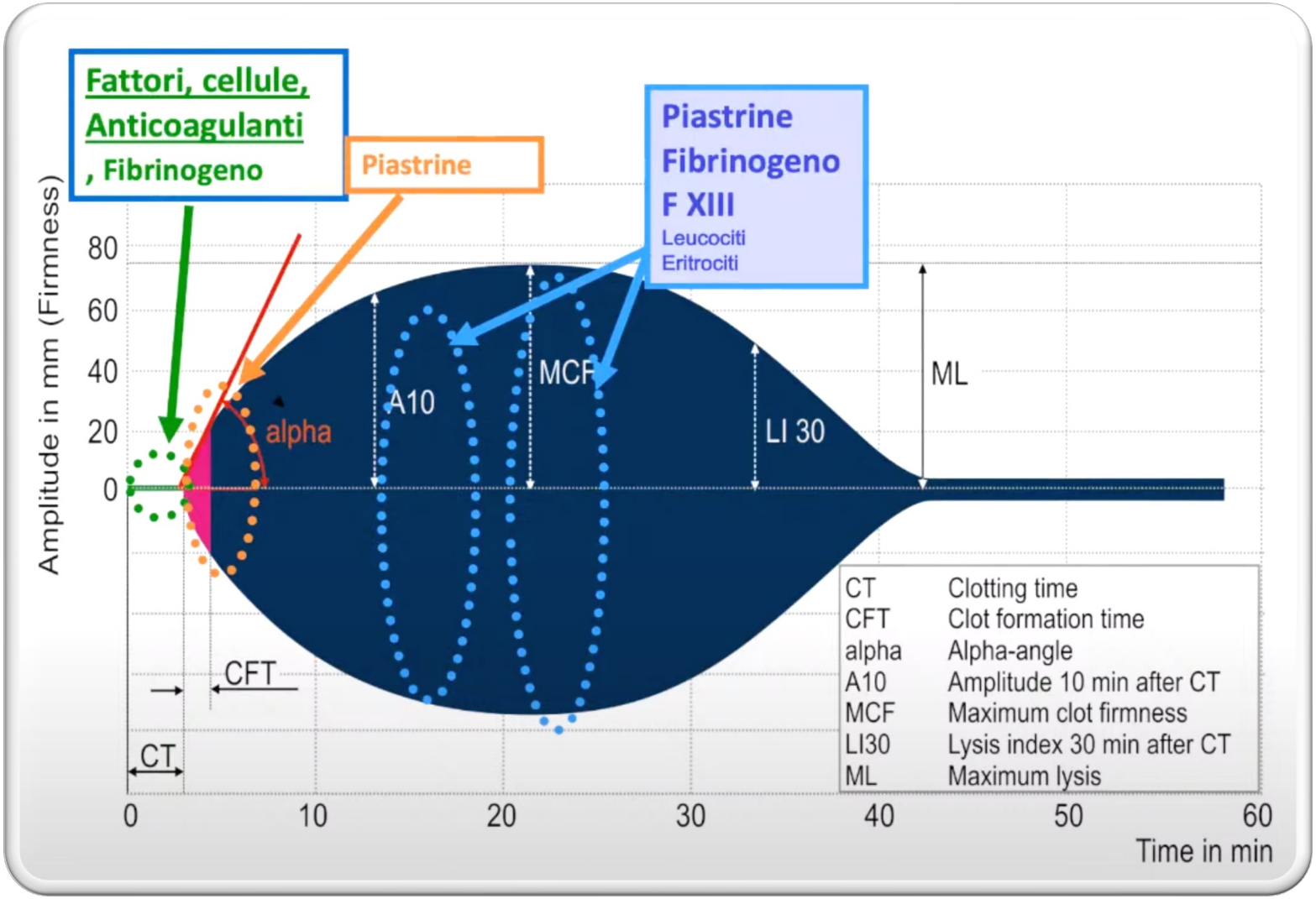
Pejù E et al. J Crit Care 76 (2023) 154293

Thromboelastography





R) Reaction time: from start to 2mm amplitude	K) Kinetics: time from 2 - 20mm amplitude	α) α-angle: of tangent line from 2 - 20mm	MA) Maximum amplitude at peak clot strength	LY30) Lysis index at 30 minutes after MA


Fattori, cellule,
Anticoagulanti
, Fibrinogeno
Piastrine
Piastrine
Fibrinogeno
F XIII
Leucociti
Eritrociti
Amplitude in mm (Firmness)
80
60
40
20
0
alpha
A10
MCF
LI 30
ML
CFT
CT
0
10
20
30
40
50
60
Time in min
CT Clotting time
CFT Clot formation time
alpha Alpha-angle
A10 Amplitude 10 min after CT
MCF Maximum clot firmness
LI30 Lysis index 30 min after CT
ML Maximum lysis

Normal
R;K;MA;Angle = Normal

Anticoagulants/hemophilia
Factor Deficiency
R;K = Prolonged;
MA;Angle = Decreased

Platelet Blockers
Thrombocytopenia/
Thrombocytopathy
R ~ Normal; K = Prolonged;
MA = Decreased

Fibrinolysis (UK, SK, or t-PA)
Presence of t-PA
R ~ Normal;
MA = Continuous decrease
LY30 > 7.5%; WBCLI30 < 97.5%;
Ly60 > 15.0%; WBCLI60 < 85%

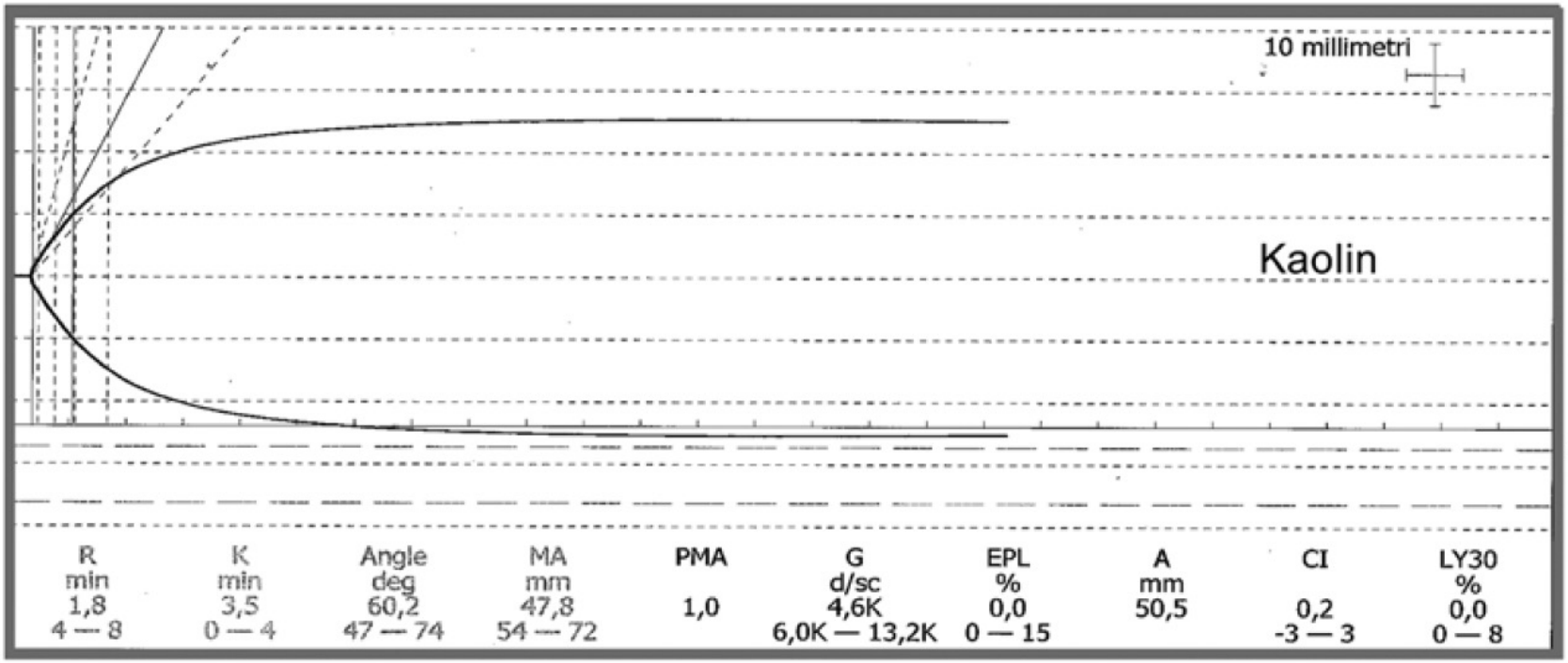
Hypercoagulation
R;K = Decreased;
MA;Angle = Increased

D.I.C
Stage 1
Hypercoagulable state with
secondary fibrinolysis

Stage 2
Hypocoagulable state

Antiphospholipid Syndrome During Septic Shock: Hyper- or Hypocoagulability?: A Case Report

Emanuele Rezoagli, MD,*†‡ Nicoletta Barzaghi, MD,§ Mark Crowther, MD,‖¶ Francesco Dentali, MD,# and Fulvio Pomero, MD**



Day 5, 6:00 pm

No anticoagulation

Plt: 9000/mm^3
INR: 2.24
aPTT: 44.6 sec
FBG: 261 mg/dL

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Antiphospholipid Syndrome During Septic Shock: Hyper- or Hypocoagulability?: A Case Report

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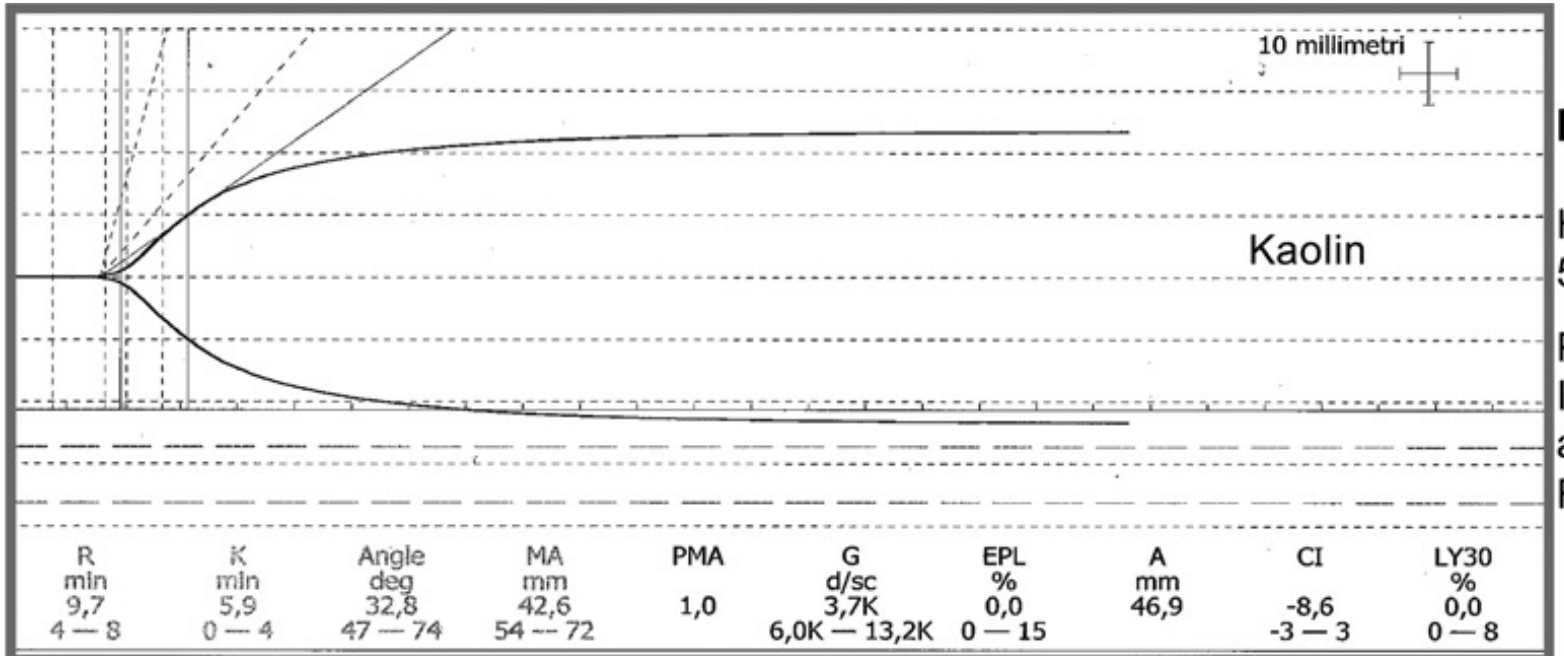

Day 6, 11:00 am

Heparin calcium
5000 IUx2

Plt: 15000/mm^3
INR: 2.02
aPTT: 56.8 sec
FBG: 221 mg/dL

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Gestione della terapia anticoagulante nel paziente piastrinopenico

FULVIO POMERO
Ospedale Michele e Pietro Ferrero
Verduno (CN)

Grazie!