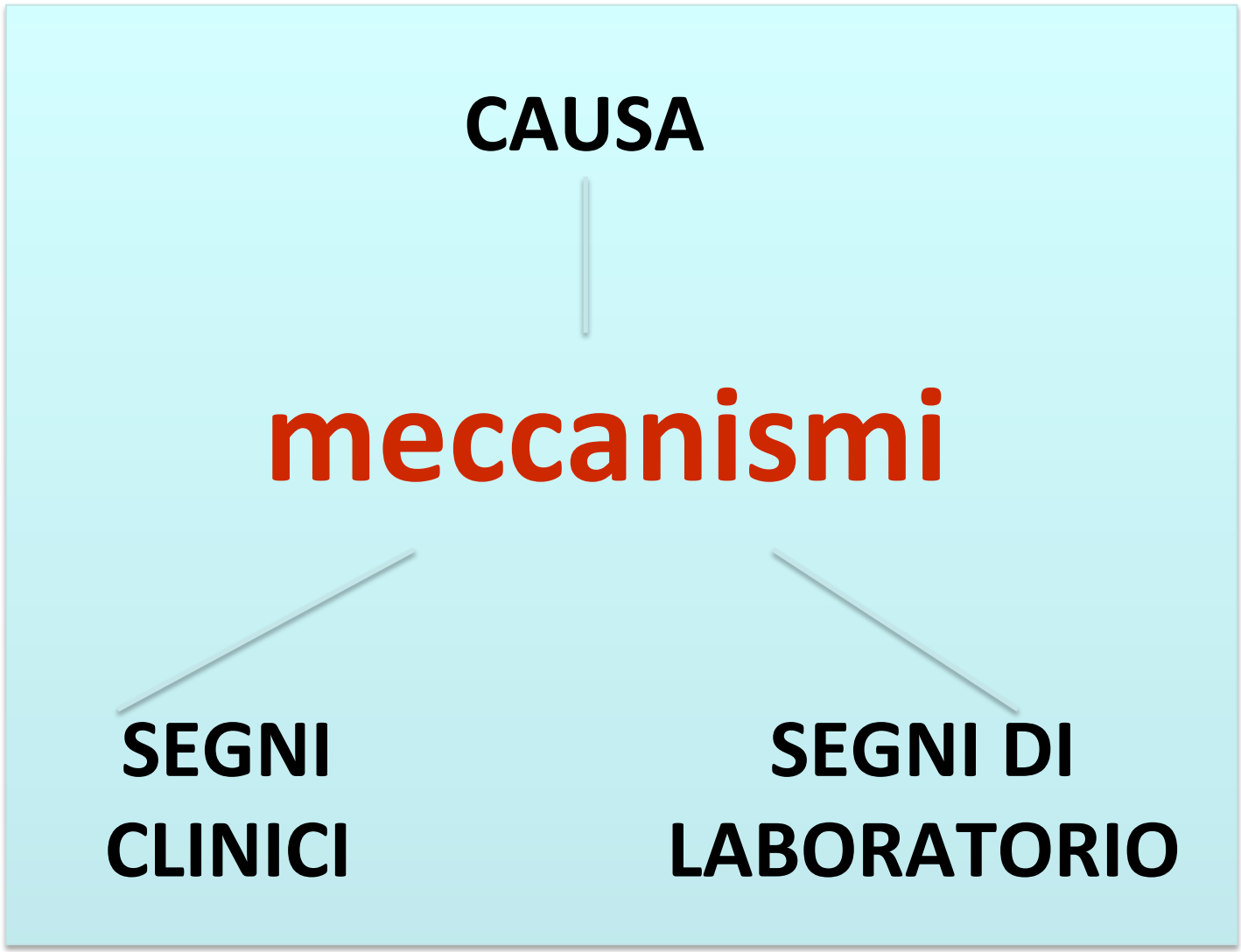
Coagulazione Intravascolare Disseminata: Diagnostica

Giovanni Poletti AUSL Romagna Patologia Clinica Ematologia Laboratorio Pievesestina

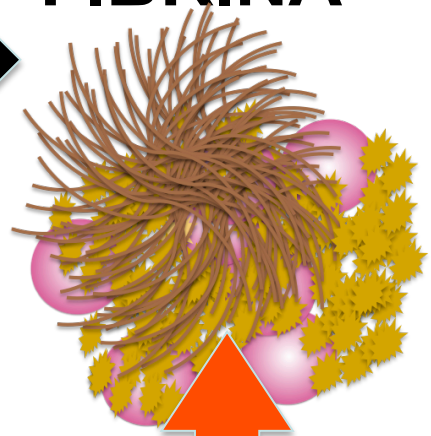
DIAGNOSI DI CID



COAGULAZIONE

Tissue Factor > **TROMBINA**

Plt attivate
FIBRINA



NORMALI MECCANISMI DI DIFESA

Plasminogeno > PLASMINA

FIBRINOLISI

CID

Tissue Factor, Cancer Proc.
Veleni

TROMBINA

- Fibrinogeno > Fibrina ↑
- FV FVIII > FVa FVIIIa ↑
- FXIII > FXIIIa ↑
- Plt > Plt attivate ↑
- TAFI > TAFIa ↑
- PAI-1 ↑ ⇢ ↑ ↓
- AT ↓
- APC SYSTEM ↓
- TFPI ↓

TROMBOSI

PLASMINA

Flogosi (PAI-2)

IPOFIBRINOLISI

MOF

tPA Annessina II
Farmaci Veleni

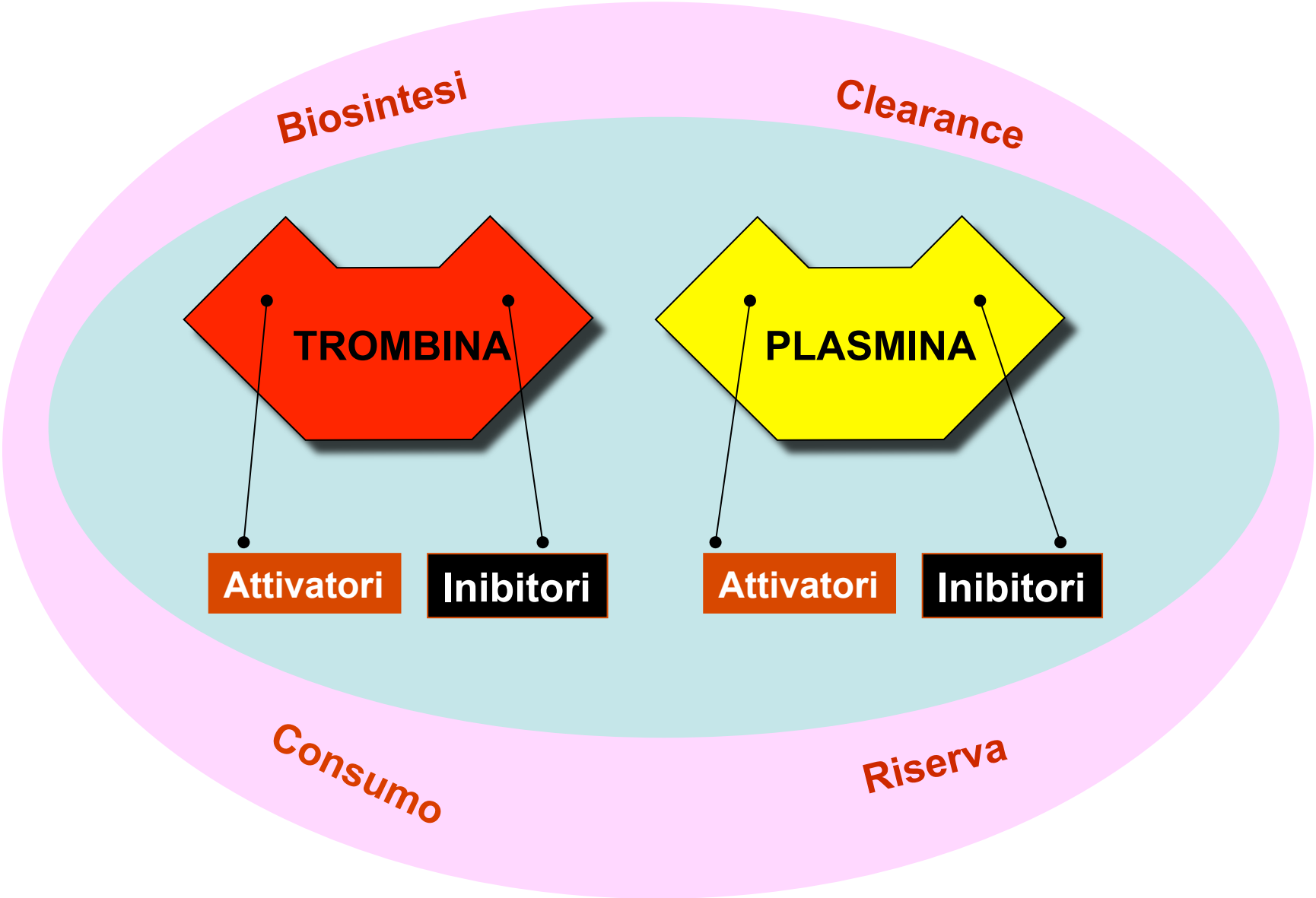
IPERFIBRINOLISI

Fibrinogeno - Fibrina ↓
FV FVIII FXIII ↓

EMORRAGIA

consumo massivo di Fattori e Piastrine

DIVERSE TIPOLOGIE DI PAZIENTI



Wada et al. Journal of Intensive Care 2014, 2:15
http://www.jintensivecare.com/content/2/1/15

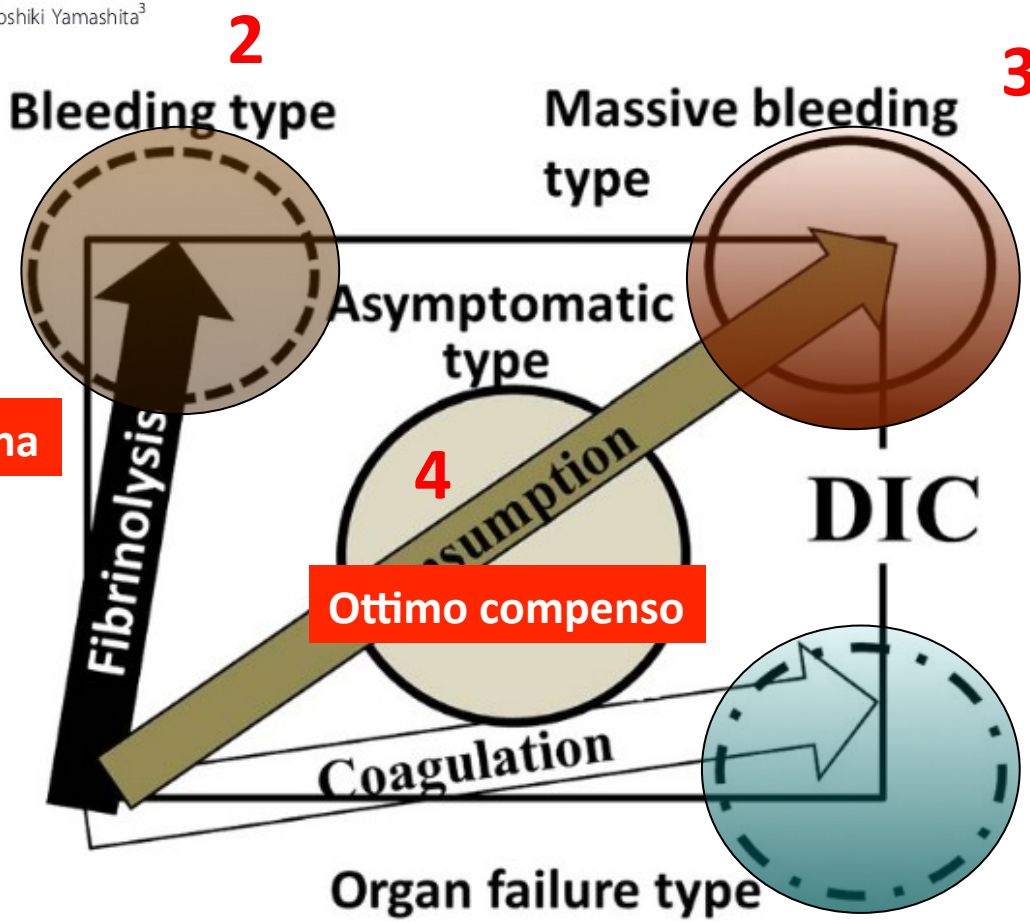
JOURNAL OF INTENSIVE CARE

REVIEW Open Access

Diagnosis and treatment of disseminated intravascular coagulation (DIC) according to four DIC guidelines

Hideo Wada[1*], Takeshi Matsumoto[2] and Yoshiki Yamashita[3]

meccanismi di CID



Plasmina

Consumo Massivo

Ottimo compenso

1

Flogosi
Danno endoteliale
PAI-1

Figure 1 Bleeding, organ failubre, massive bleeding, and non-symptomatic types of DIC.

Table I. Conditions associated with DIC.

Sepsis and severe infection
Trauma
Organ destruction e.g pancreatitis
Malignancy
Solid tumours
Leukaemia
Obstetric
Amniotic fluid embolism
Placental abruption
Pre-eclampsia
Vascular abnormalities
Large haemangiomata
Vascular aneurysm
Severe liver failure
Toxic and immunological insults
Snake bites
Recreational drugs
ABO transfusion incompatibility
Transplant rejection

 British Journal of Haematology, **145**, 24–33

LA CAUSA

Diagnosi

Patogenesi

Terapia - Prognosi

Wada et al. Journal of Intensive Care 2014, 2:15
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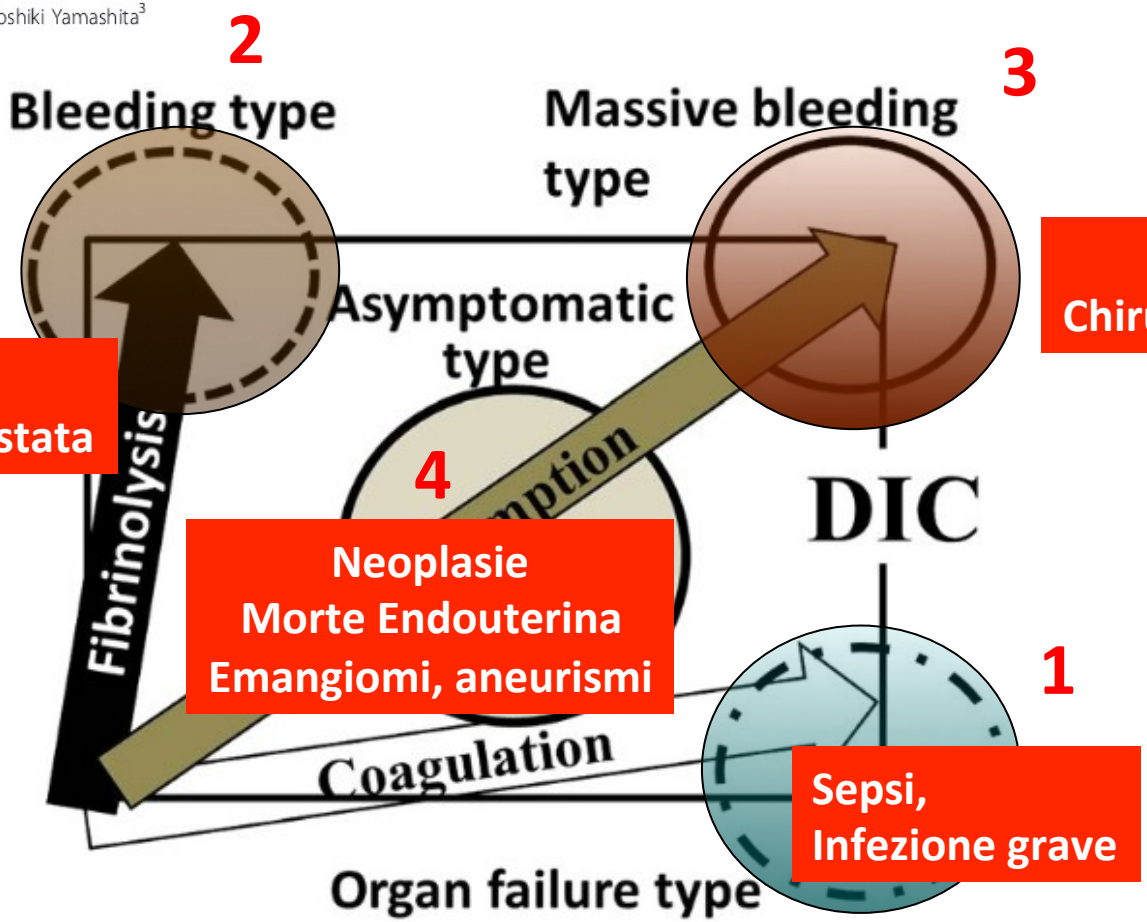
Diagnosis and treatment of disseminated intravascular coagulation (DIC) according to four DIC guidelines

Hideo Wada[1*], Takeshi Matsumoto[2] and Yoshiki Yamashita[3]

correlazione meccanismi-causa



APL
neoplasie prostata

Trauma
Chirurgia maggiore

Neoplasie
Morte Endouterina
Emangiomi, aneurismi

Sepsi,
Infezione grave

Figure 1 Bleeding, organ failubre, massive bleeding, and non-symptomatic types of DIC.

Il Laboratorio

caratterizzazione della causa

segni della CID

Trombina

↓

Consumo
Piastrine e Fattori

↓

Plt
PT
aPTT

Plasmina

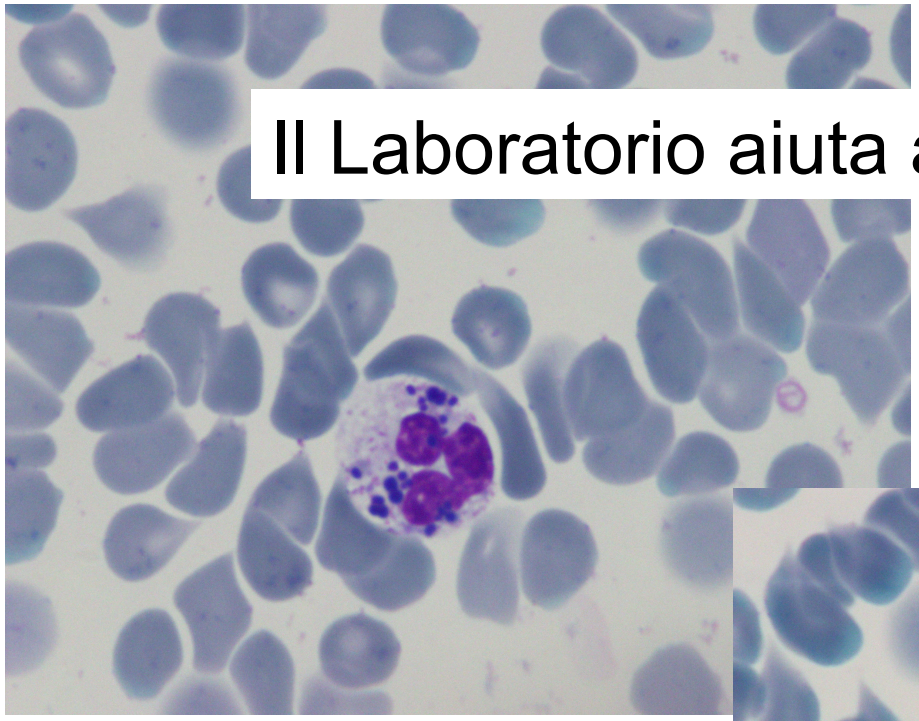
↓

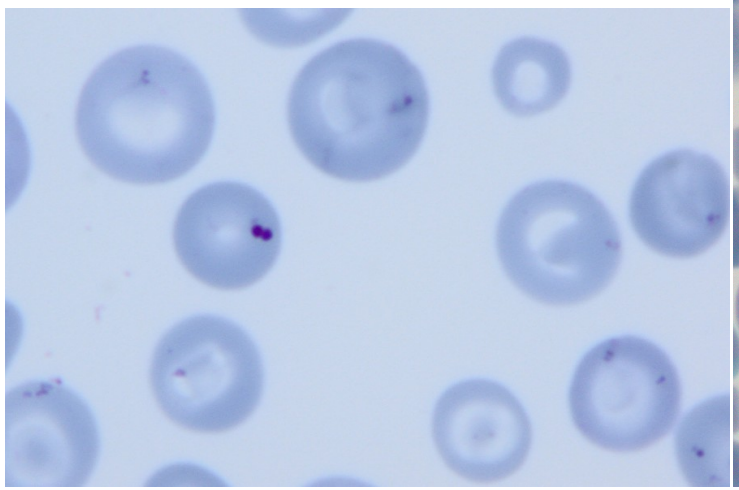
Degradazione
Fibrinogeno/Fibrina

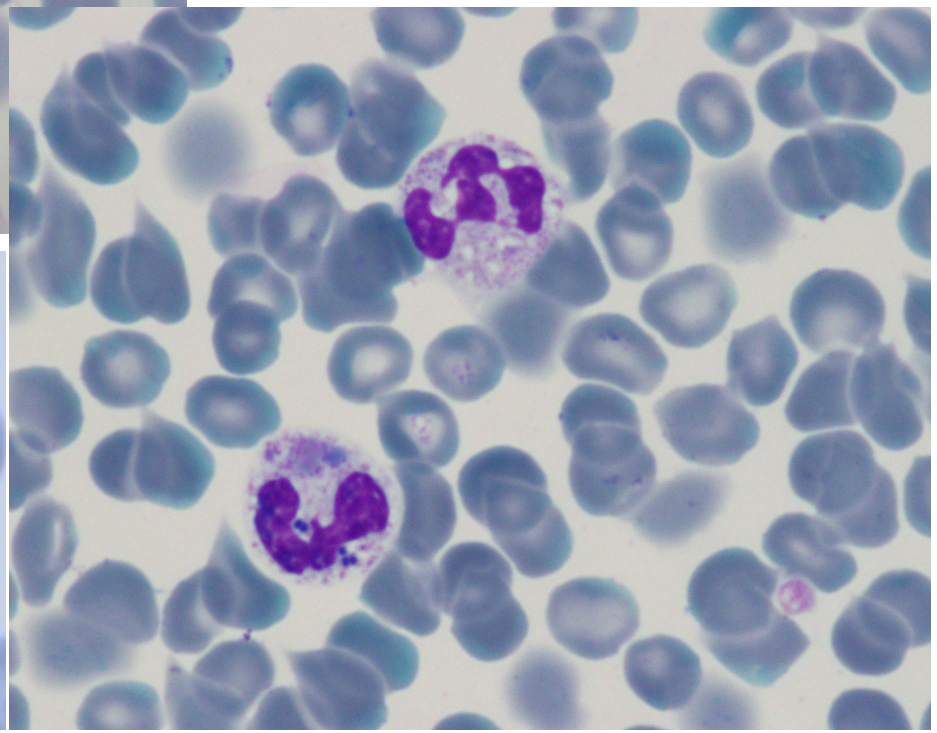
↓

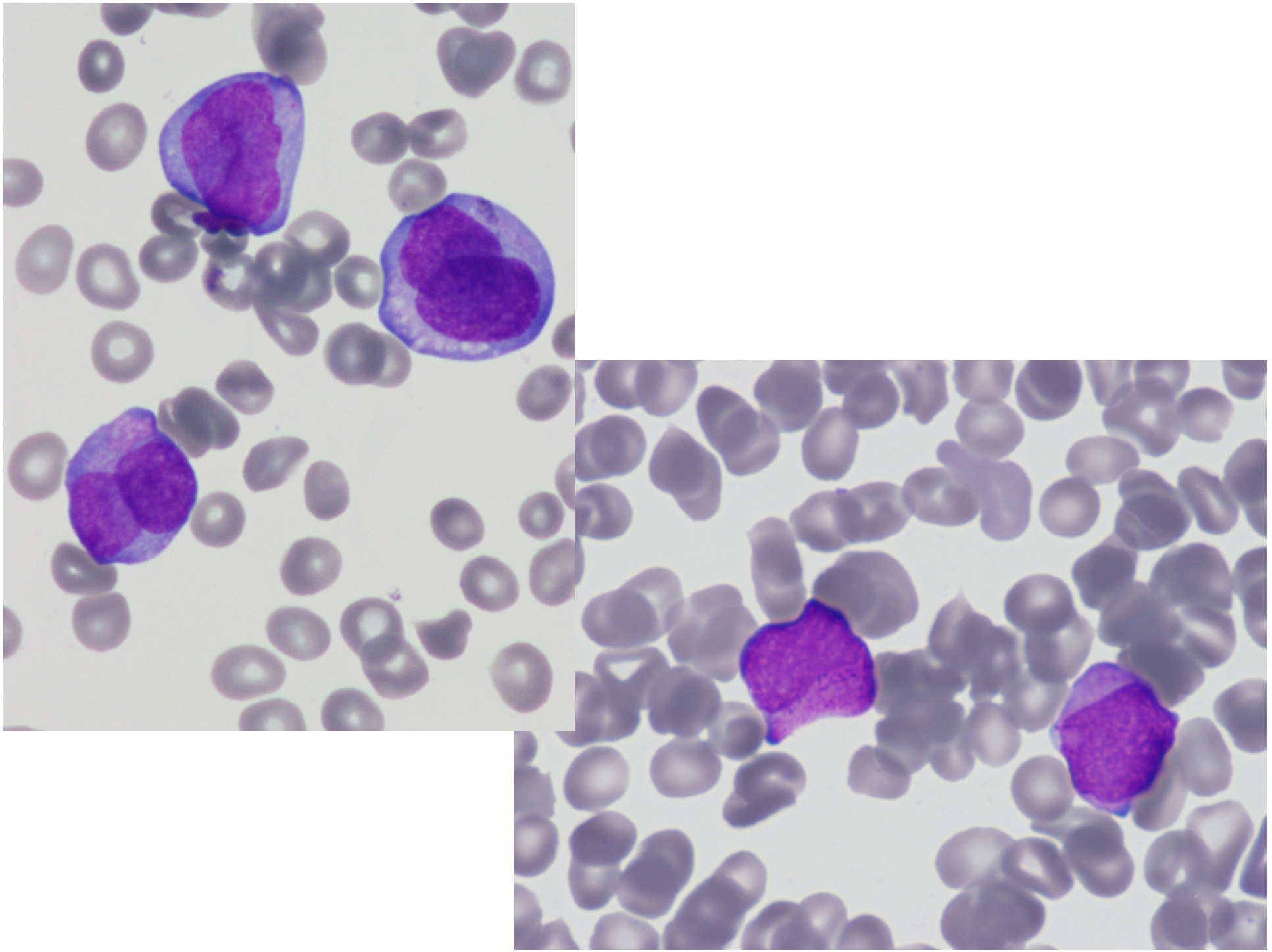
D-Dimero
Fibrinogeno

Il Laboratorio aiuta a trovare la causa

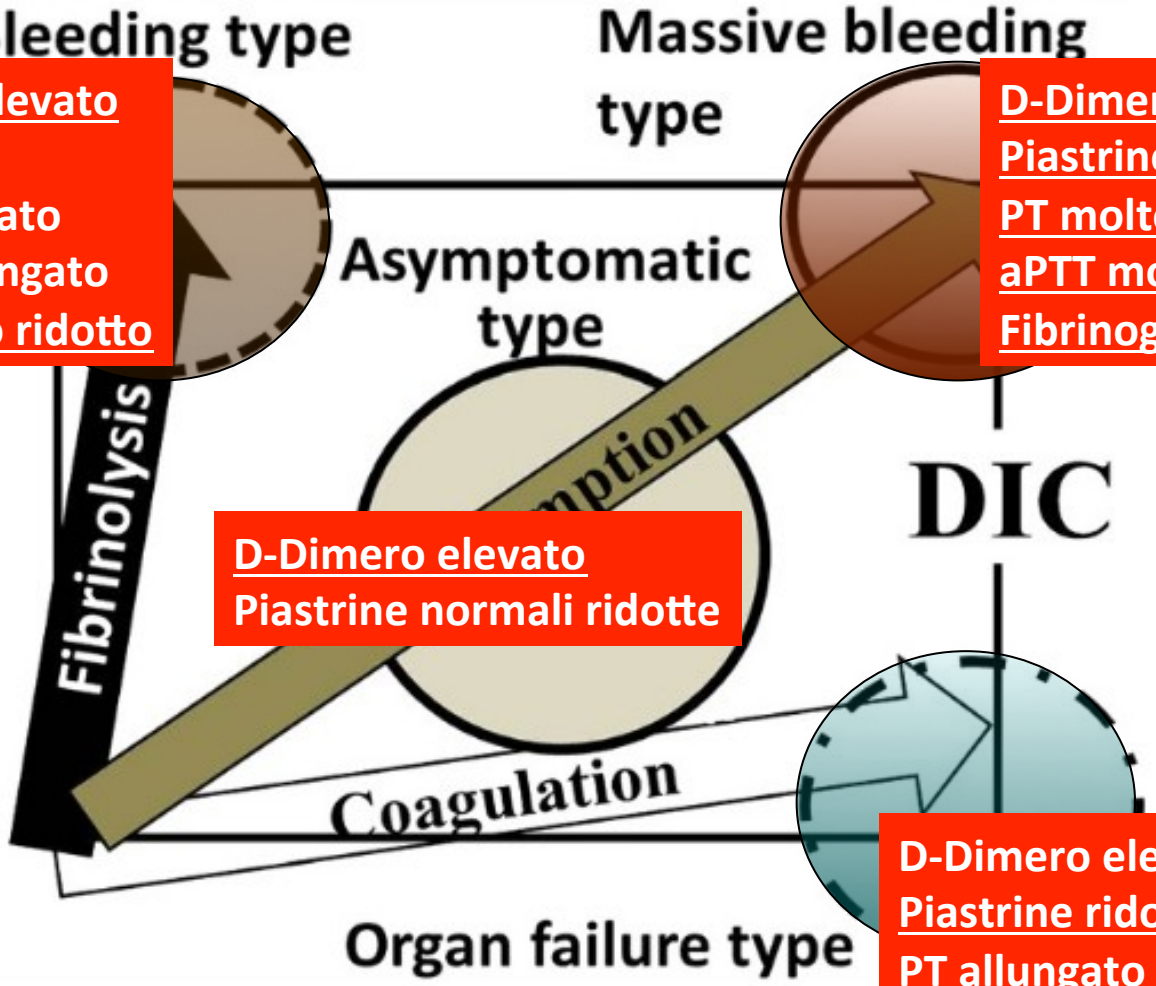








Correlazione meccanismi-esami



D-Dimero molto elevato
Piastrine normali
PT normale allungato
aPTT normale allungato
Fibrinogeno molto ridotto

D-Dimero molto elevato
Piastrine molto ridotte
PT molto allungato
aPTT molto allungato
Fibrinogeno molto ridotto

D-Dimero elevato
Piastrine normali ridotte

D-Dimero elevato
Piastrine ridotte
PT allungato
aPTT anche ridotto
Fibrinogeno spesso normale

Figure 1 Bleeding, organ failubre, massive bleedi
non-symptomatic types of DIC.

PT

APTT

fibrinogeno

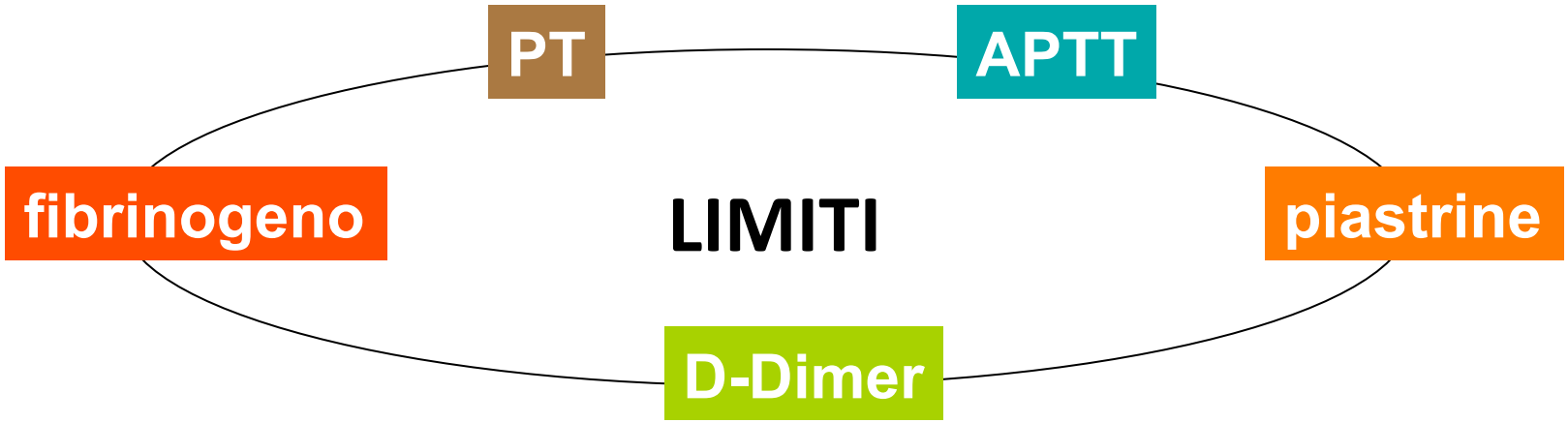
LA VALUTAZIONE

piastrine

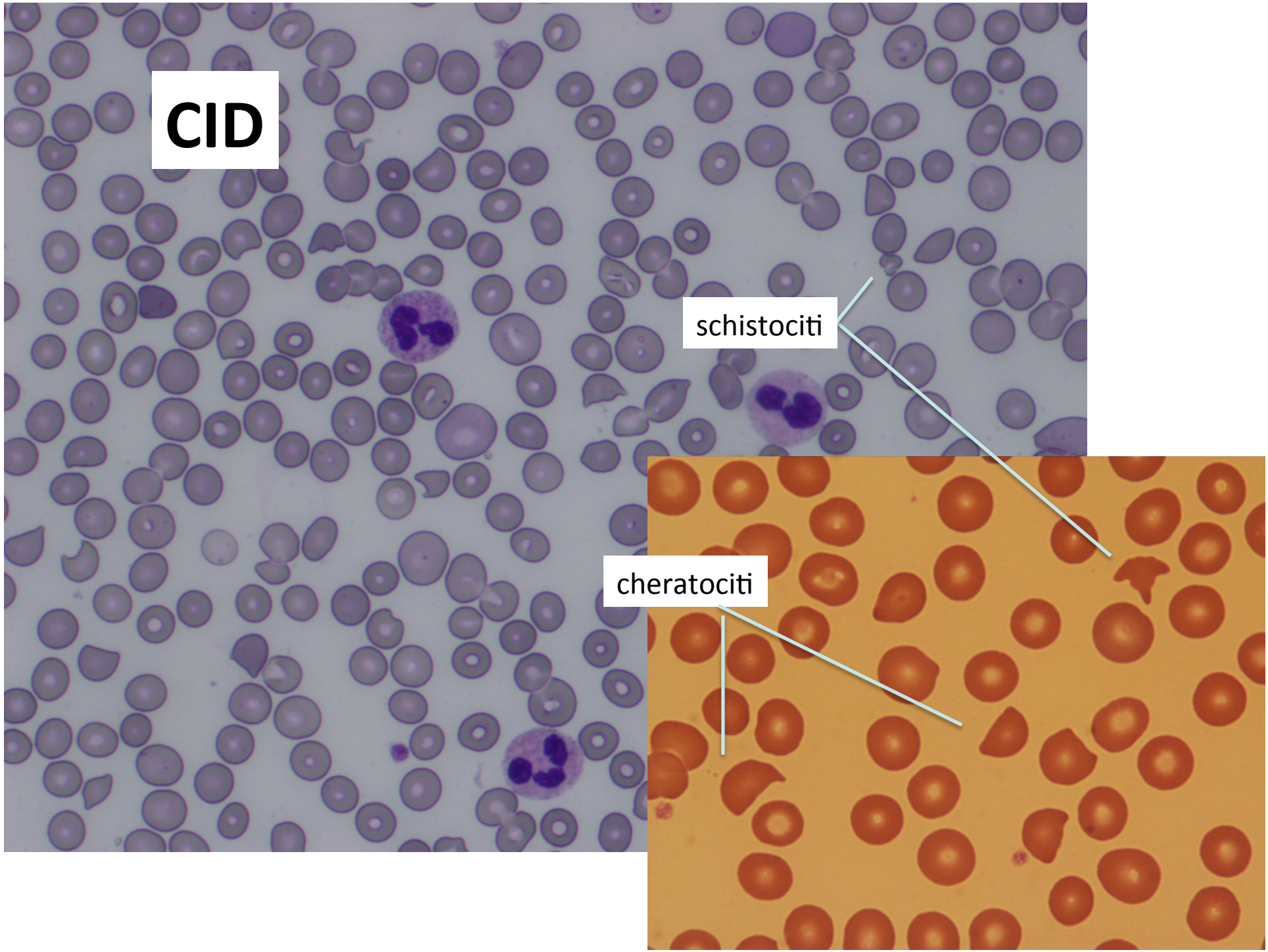
D-Dimer

il vero riferimento è il setting del paziente e non i “valori normali”

Fibrinogeno 180 mg/dl

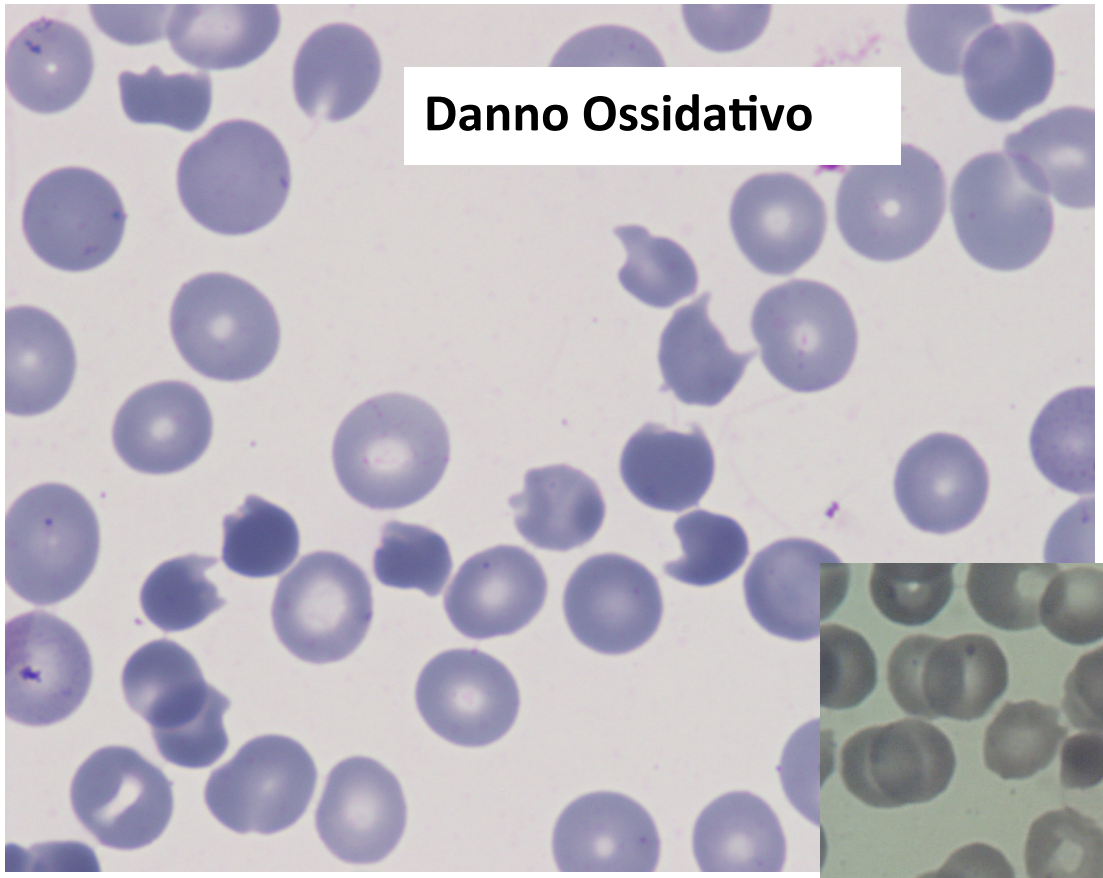


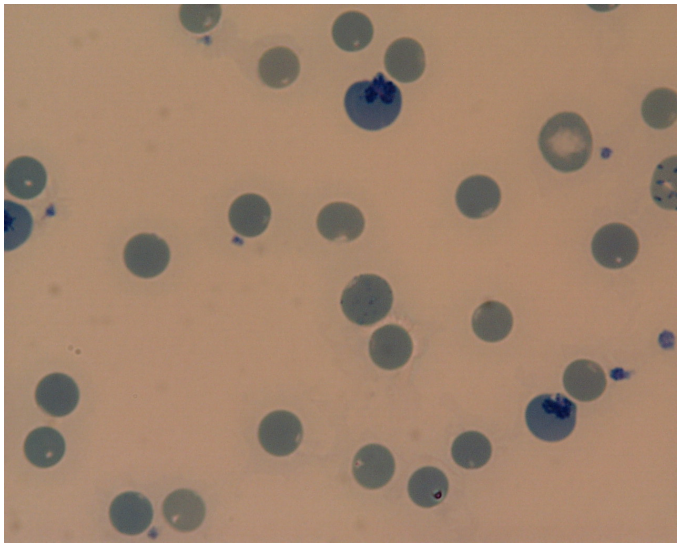
- alterazioni simili, ma non causate dalla CID
- informazione non rappresentativa di un processo dinamico come la CID
- si tratta in prevalenza di esami che vedono un effetto tardivo
- scarsa standardizzazione dei metodi e delle unità di misura

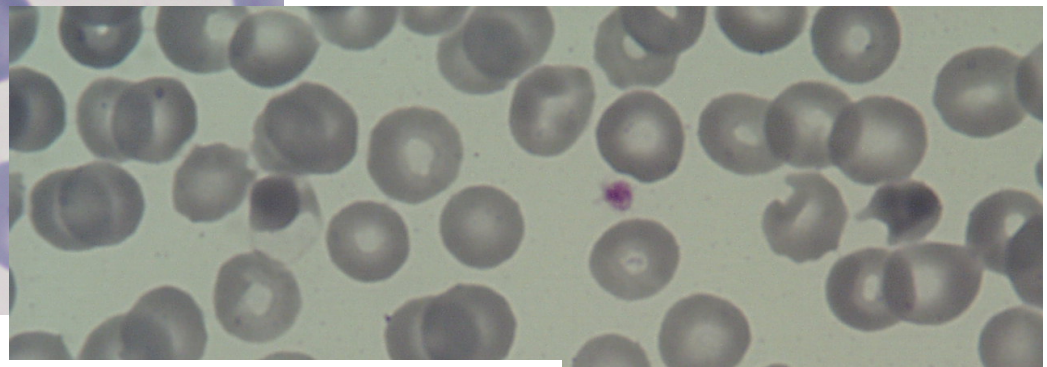

CID
schistociti
cheratociti

Frammentazione eritrocitaria
CID
TTP-HUS
Valvulopatie cardiache
Glomerulonefriti
Trapianto renale
Vasculiti
Neonato
Esposizione al calore
Ustioni
Piropoichilocitosi
Talassemie Anemia Falciforme Anemia Megaloblastiche
MDS
Danno ossidativo
…

I difetti morfologici vanno collocati nel contesto clinico e morfologico globale







Cheratociti, ma con emazie contratte

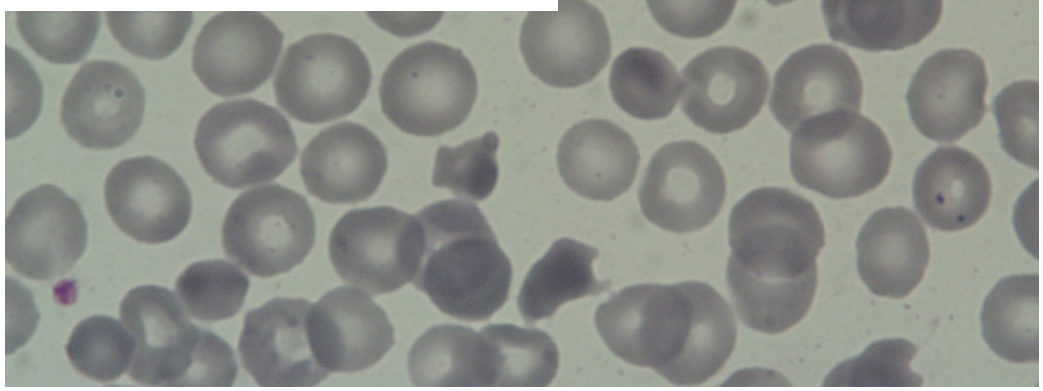


Table 1
Diagnostic scores for disseminated intravascular coagulation.

	ISTH	JMHW	JAAM	KSTH
Underlying disorder known to be associated with DIC	Required	1 point	0 points	0 points
Bleeding	0 points	No hematological malignancy: 1 point Hematological malignancy: 0 point	0 points	0 points
Thrombosis related organ failure	0 points	Present: 1 point; absent: 0 point	0 points	0 points
Systemic inflammatory response syndrome criteria	0 points	0 points	0-2: 0 points ≥3: 1 points	0 points
Prolonged thrombin time	<3 sec: 0 points ≥3 sec: 1 point ≥6 sec: 2 points	Prothrombin time ratio: <1.25: 0 points 1.25–1.67: 1 point ≥1.67: 2 points	Prothrombin time ratio <1.2: 0 points ≥1.2: 1 point	>3 sec: 1 point (or aPTT>5 sec: 1 point)
Fibrinogen level (g/L)	>1: 0 points ≤1: 1 point	>1.5: 0 points 1.0–1.5: 1 point ≤1: 2 points	≥3.5: 0 points <3.5: 1 point	<1.5: 1 point
Elevated fibrin related marker (e.g. soluble fibrin monomers, d-dimer)	No increase: 0 point Moderate increase: 2 points (D-dimer: increase ≤10 fold limit of normal) Marked increase: 3 points (>10 fold limit of normal)	Fibrin degradation product (μg/mL): <10: 0 point 10–20: 1 point 20–40: 2 points ≥40: 3 points	Fibrin/fibrinogen degradation products (mg/L) <10: 0 point ≥10 and <25: 1 point ≥25: 3 points	D-dimer increase: 1 point
Platelet count (x109/μL)	>100: 0 point ≤100: 1 point ≤50: 2 points	Patients with hematological malignancy: 0 points Patients without hematological malignancy: >120: 0 points 80–120: 1 point 50–80: 2 points ≤50: 3 points	≥120: 0 point ≥80 and <120 or >30% decrease within 24 hrs: 1 point <80 or >50% decrease within 24 hrs: 3 points	<100: 1 point
Total	DIC≥5 points No DIC <5 points	Patients with hematological malignancy:≥4 points No hematological malignancy: ≥7 points	DIC≥5 points No DIC <5 points	DIC≥3 points No DIC<3 points

ISTH 2007

International Society on Thrombosis and Hemostasis

(Toh and Hoots)

1. Risk assessment: does the patient have an underlying disorder known to be associated with overt DIC?

   If yes: Proceed.

   If no: Do not use this algorithm.

2. Order global coagulation tests (platelet count, prothrombin time, fibrinogen, fibrin-related marker).

3. Score global coagulation test results.

- Platelet count
  (>100 = 0; <100 = 1; < 50 = 2) ☐ (0-2)
- Elevated fibrin related marker (e.g. D-dimers; fibrin degradation products)
  (no increase = 0; moderate increase = 2; strong increase = 3) ☐ (0-3)
- Prolonged prothrombin time
  (< 3 s = 0; > 3 but < 6 s = 1; > 6 s = 2) ☐ (0-2)
- Fibrinogen level
  (>1.0g L^{-1} = 0; < 1.0g L^{-1} = 1) ☐ (0-1)

5. Calculate score ☐ (0-8)

   If ≥ 5: compatible with overt DIC: repeat score daily

   If < 5: suggestive (not affirmative) for non-overt DIC: repeat next 1–2 days.

Prospective validation of the International Society of Thrombosis and Haemostasis scoring system for disseminated intravascular coagulation*

Bakhtiari, Kamran BSc; Meijers, Joost C.M. PhD; de Jonge, Evert MD; Levi, Marcel MD

Critical Care Medicine: December 2004 - Volume 32 - Issue 12 - pp 2416-2421

validita' dello score

- sensibilità: 91%
- specificità : 97%
- buona correlazione fra score e outcome clinico (per ogni punto dello score la mortalità incrementa di 1.25-1.29 volte)

LA DIAGNOSI DI CID: CONCLUSIONI

1. in caso di segni clinici e/o di laboratorio cercare sempre una possibile causa
2. usare test semplici e considerare il monitoraggio
3. interpretare i risultati avendo come riferimento il paziente
4. escludere tutte le cause che possono influire nei risultati dei test prima di attribuire le alterazioni alla CID