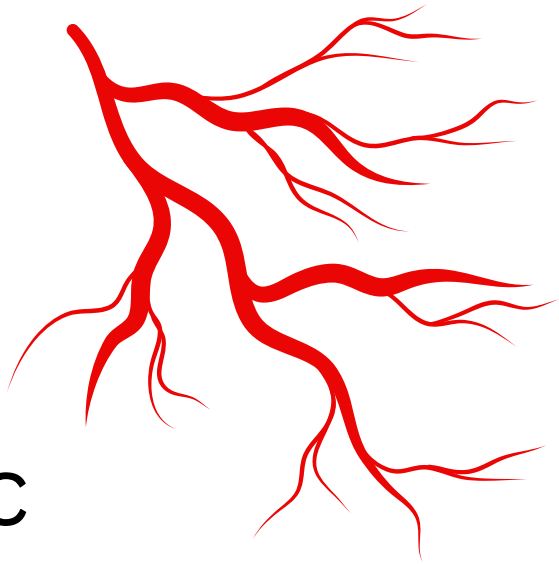
The Blood Project

Pocket Resource

Diagnosis and Management of Immune Thrombotic Thrombocytopenia Purpura (TTP)



A Pocket Resource for Clinicians

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Diagnosis

Suspect diagnosis of immune TTP (iTTP) in adults with:*

- Microangiopathic hemolytic anemia (MAHA)
- Thrombocytopenia
- New focal neurological findings
- Prior history of TTP

* Classic pentad in < 20% patients

Confirm diagnosis of immune TTP by demonstrating:

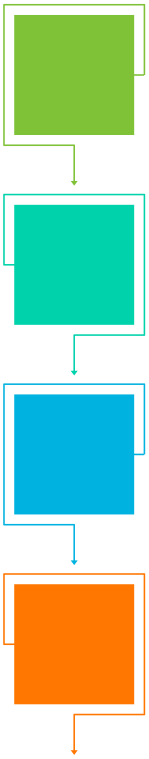
- Reduced plasma ADAMTS13 activity (< 10%)
- Presence of a functional inhibitor of ADAMTS13

ADAMTS13 activity levels usually take several days to come back. Thus, ***conditional diagnosis*** (to initiate appropriate treatment) is based on clinical scoring system such as the **PLASMIC score:**

Plasmic score

Parameter	Result	Points
Platelet count	< 30	+1
Hemolysis	Indirect bilirubin > 2 mg/dL or retics > 2,5% or undetectable haptoglobin	+1
Creatinine	< 2.0 mg/dL	+1
No active cancer in past year		+1
No history of transplantation		+1
INR	< 1.5	+1
MCV	< 90 fL	+1

Workflow



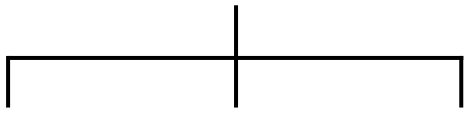
Suspect TTP

Order ADAMTS13

Calculate PLASMIC score

If high risk, treat as TTP, pending ADMATS13 levels

Order set — ADAMTS13



MAHA Low PLT

- CBC
- Retic count
- Peripheral smear
- LDH
- Haptoglobin
- Indirect bilirubin

Organ dysfunction

- Creatinine
- Troponin
- LFTs
- EKG
- CT/MRI of brain if CNS findings

Secondary causes, other causes of TMA

- HIV
- HCV
- HBV
- ANA
- PT/aPTT
- B12
- DAT

Plasmic score	Risk group
0-4	Low
5	Intermediate
6-7	High

MCV, mean cell volume; CBC, complete blood count; LFTs, liver function tests; HCV, hepatitis C, HBV, hepatitis B, DAT, direct antiglobulin test

Treatment (1st acute event)

Based on 2 clinical practice guidelines: International Society of Thrombosis (ISTH) and Haemostasis and British Society of Hematology (BSH)

ISTH

J Thromb Haemost. 2020;18:2486
J Thromb Haemost. 2020;18:2496

If high clinical suspicion based on risk assessment method

While waiting for results of ADAMTS13:

- **Start TPE and corticosteroids without waiting for the results of ADAMTS13 testing** *(strong recommendation)*
- **Consider early administration of caplacizumab** *(conditional recommendation)*

ADAMTS13 activity result

<10-20%*

< 10%

Continue caplacizumab

+

Consider rituximab *(conditional recommendation)*

> 20%

Stop caplacizumab

**If ADAMTS13 10%-20%, use clinical judgment*

In general, prophylactic **platelet transfusions** are avoided in nonbleeding TTP; may be considered if serious bleeding

TPE, therapeutic palsma exchange

BSH

Br J Haematol. 2023;203:546

Treat TTP as an medical emergency (1A)
Typically in a critical/intensive care setting

While waiting for results of ADAMTS13:

- **Start *daily* TPE* and corticosteroids** without waiting for the results of ADAMTS13 testing** *(1A)*

If necessary, transfer patient to a facility that can perform TPE

***Prednisone equivalent of 1 mg/kg/day*

ADAMTS13 activity reusult

< 10%

> 20%

Start:

- **caplacizumab**** *(1A)*
- **Rituximab** *(1B)*

Provide thromboprophylaxis once platelet counts are ≥50 × 10 ^{9}/L

Platelet transfusion should be avoided (1B)

* **TPE** *should be initiated within four to eight hours and continued daily (1-1.5 x volume replacement). Stop TPE when sustained PLT >150 × 10 9/L. for additional guidance see AFSA guideline on the use of therapeutic apheresis. J Clin Apher 2023;38:77*

***IV dose of* **caplacizumab** *10 mg is given pre-TPE. A once daily 10 mg sc is continued up to 30 days following completion of TPE*

Treatment (1st acute event)

Overview

1

Suspect TTP

Suspect diagnosis of immune TTP (iTTP) in adults with:

- Microangiopathic hemolytic anemia (MAHA)
- Thrombocytopenia
- New focal neurological findings
- Prior history of TTP

2

Order blood AAMTS13 levels

3

Calculate PLASMIC score

Plasmic score	Risk group
0-4	Low
5	Intermediate
6-7	High

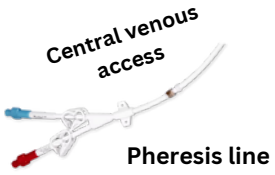
PLASMIC (one point each):

- Platelet count
- Hemolysis
- Creatinine
- Active cancer
- Transplant recipient
- INR
- MCV

4

If high risk, treat as TTP, pending ADMATS13 levels

- Daily **TPE** and **corticosteroids**
- Consider administration of **caplacizumab** before ADAMTS13 results (ISTH)
- Avoid **platelet transfusion** if possible



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If ADMATS13 level is < 10%

- Continue daily **TPE** and **corticosteroids**
- Stop TPE once platelets consistently > 150 x 10^9/L
- Start **caplacizumab (BSH)**
- Consider **rituximab**
- Avoid **platelet transfusion** if possible
- **Thromboprophylaxis** when platelet count > 50 x 10^9 /L

3 pronged therapeutic approach

Remove autoantibodies against ADAMTS13 (TPE)

Inhibit production of autoantibodies against ADAMTS13 (steroids, rituximab)

Inhibit platelet binding to von Willbrand factor