TEG and ROTEM: Reading Viscoelastic Tests

What the tracing shows that PT/INR and aPTT miss, each value and the product it points to, example ranges, and TXA timing

ICU Basics
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WHAT YOU WILL DO

- Draw the sample the right way (usually a blue-top citrate tube filled to the line) and get it to the analyzer fast.
- Read the result with the team: which phase of the clot is abnormal, and which product or drug that points to.
- Hang the ordered products, keep tracking what has been given, and repeat the test after each round.
- Give TXA on time in trauma; do not wait for the tracing.

WHAT TEG AND ROTEM ADD TO PT/INR AND APTT

PT/INR and aPTT time only the first strands of fibrin in plasma. TEG (thromboelastography) and ROTEM (thromboelastometry) watch a whole-blood clot form, firm up and break down, so they also show fibrinogen function, platelet contribution to strength and fibrinolysis. A first result is often ready in 10–20 minutes, faster than a lab panel.

The tracing is a line that splits into a widening spindle. Time before it splits = how fast clotting starts. How steeply it opens = how fast fibrin builds. Widest point = clot strength. Narrowing after the peak = clot breaking down.

EACH VALUE AND WHAT IT POINTS TO

CLOT PHASE	TEG	ROTEM	MAINLY REFLECTS	IF ABNORMAL, THINK OF
Start	R time	CT (clotting time)	Clotting factors; heparin	Long: plasma or PCC (heparin: check heparinase or HEPTEM)
Build-up speed	K time, α angle	CFT, α angle	Fibrinogen, some platelets	Long K or low angle: cryo or fibrinogen concentrate
Fibrin alone	Functional fibrinogen MA	FIBTEM A10 or MCF	Fibrinogen (platelets blocked)	Low: cryo or fibrinogen concentrate
Strength	MA	MCF, A10 (EXTEM)	Platelets, then fibrinogen	Low with normal fibrin part: platelets
Breakdown	LY30	ML; LI30 or LI60	Fibrinolysis	High lysis: antifibrinolytic (TXA)

Examples only. Ranges change with the analyzer, cartridge and activator: use the ranges printed on your lab report.

VALUE	EXAMPLE: KAOLIN TEG 5000	EXAMPLE: ROTEM SIGMA EXTEM C	FIBTEM C
R / CT	5–10 min	51–73 s	—
K; α angle	K 1–3 min; α 53–72°	Not in cleared claims	—
MA / MCF	50–70 mm	57–72 mm (A10 45–62)	MCF 6–19 mm (A10 6–17)
Lysis	LY30 0–8%	ML 0–6% at 60 min	—

EXAM TIP Low MA or MCF: look at the fibrinogen part first. If FIBTEM or functional fibrinogen is low, give fibrinogen; if it is normal, the weak clot is platelets.

TXA IN TRAUMA IS TIME-BASED

SAFETY In bleeding trauma, TXA goes in as soon as possible and within 3 hours of injury (CRASH-2: 1 g IV over 10 min, then 1 g over 8 h). Do not hold it for a TEG or ROTEM result. Started after 3 hours it raised bleeding deaths. Record the injury time and the dose time.

CALL FOR HELP WHEN

- Bleeding continues (chest tube, drains, wound, vaginal) after a round of products.
- A new result shows a flat or narrow tracing, a long R/CT, or high lysis.
- The trauma patient is near the 3-hour TXA window and none is ordered.
- Hypotension, rising lactate, temperature below 96.8 °F (36 °C) or low ionized calcium during transfusion.
- The tracing and the bleeding do not match: ask for a repeat sample and check how it was drawn.

CHECK YOUR UNIT'S POLICY

Check your unit's policy for which analyzer and cartridge you use, its reference ranges and treatment algorithm, who draws and runs the sample, how much discard to waste from a line, and whether TEG or ROTEM is part of your massive transfusion protocol.

Sources (10) are listed with links at icubasics.com/sheets/teg-rotem.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.