

# Southwest General Medical Center TEG Resources

## *TEG Clinical Specialist*

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440-420-2360
- Available for in person clinical consultation regarding TEG Education, Interpretation and support

## **College of TEG E-Learning: Online Access Instructions**

1. Go to <https://tegtraining.haemonetics.com>
2. Enter your account details when prompted
  - a. Account Name: **SWGeneral**
  - b. Account Password: **teg522**
3. **Select** desired training module or assessment
4. **Enter** your first and last name and **Submit** to begin the module
5. Courses take approximately ½ hour, progress is **tracked**, allowing you to come back to complete.

## **Haemonetics Online Resources** [www.haemonetics.com](http://www.haemonetics.com)

- [TEG References](#)
  - [TEG Top Literature Resources](#)
  - [PlateletMapping Studies](#)
- 📖 “badge buddies” and clinical guide
- 📞 **1-800-GET-A-TEG**
- 24/7 Support

## **Haemonetics Support and Resources**

Haemonetics Grant Program application

- <http://haemonetics.com/en/about/grants/grant-program>

Haemonetics Medical Affairs Team: [haemoneticsMedInfo@haemonetics.com](mailto:haemoneticsMedInfo@haemonetics.com)

- Literature lists/searches
- Protocol collaboration, clinical problem solving and program networking

## **DOCmatter—Peer to Peer TEG Discussion Forum:** [www.docmatter.com](http://www.docmatter.com)

- Independent of Haemonetics, allows for international collaboration between TEG users, researchers and clinicians/laboratorians.
- Webinars, Case Studies etc.
- Free registration



**HAEMONETICS®**

## INTEGRATED DEVICES

This guide is not intended as a substitute for the TEG® 5000 System User Manual.

Please refer to the TEG® 5000 System User Manual for Indications for Use, Contraindications, Warnings, Precautions, and Potential Adverse Events.

Results from the TEG analysis should not be the sole basis for a patient diagnosis, but should be evaluated together with the patient's medical history, the clinical picture and, if necessary, further hemostasis tests.

**TEG® 5000**

Clinical Aid

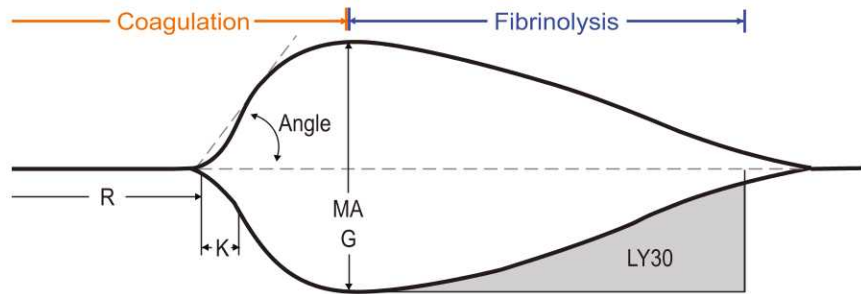
Hotline 1.800.GET.A.TEG

# Test Purpose

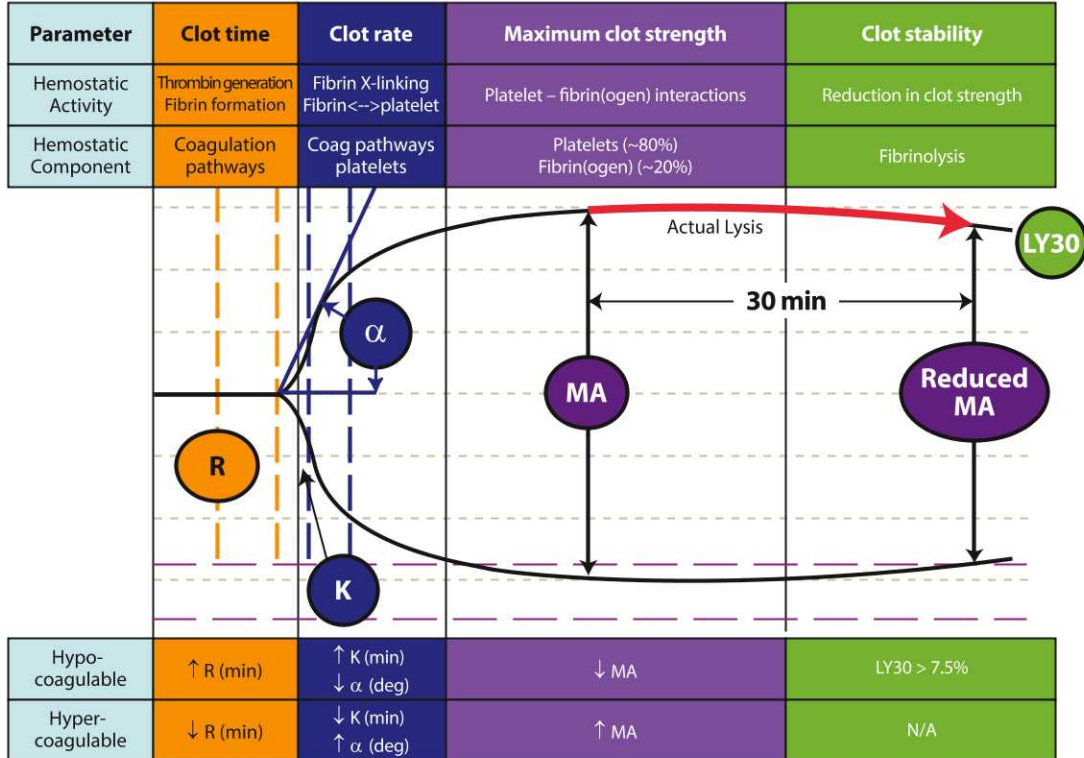
Test	Clinical Opportunity	TEG Samples*	Clot Formation Measurements
General Hemostasis	<input type="checkbox"/> Pre screening <input type="checkbox"/> Perioperative <input type="checkbox"/> ICU <input type="checkbox"/> Maintenance	K / CK PlateletMapping® Assay	<input type="checkbox"/> Coagulation factor function <input type="checkbox"/> Platelet function — without platelet inhibitor effect <input type="checkbox"/> Abnormal lysis
Heparin Effect and Heparin Reversal	<input type="checkbox"/> Pre screening <input type="checkbox"/> Perioperative <input type="checkbox"/> ICU	K / CK (plain cup) KH / CKH (blue cup)	<input type="checkbox"/> Comparison demonstrates the magnitude of heparin effect <input type="checkbox"/> Coagulation factor function <input type="checkbox"/> Platelet function — without platelet inhibitor effect <input type="checkbox"/> Abnormal lysis
Antiplatelet Therapy	<input type="checkbox"/> Pre screening <input type="checkbox"/> Perioperative <input type="checkbox"/> ICU	PlateletMapping® Assay	<input type="checkbox"/> % platelet inhibition relative to agonist <input type="checkbox"/> Platelet function baseline <input type="checkbox"/> Coagulation factor function <input type="checkbox"/> Abnormal lysis
Fibrinogen/Platelets	<input type="checkbox"/> Pre screening <input type="checkbox"/> Perioperative <input type="checkbox"/> ICU	FF & K / CK	<input type="checkbox"/> Comparison demonstrates the individual contribution of fibrin and platelets to the clot

\* K = Kaolin; CK = Citrated Kaolin; KH = Kaolin Heparinase; CKH = Citrated Kaolin Heparinase;  
FF = Functional Fibrinogen; CFF = Citrated Functional Fibrinogen

Parameter	Definition	Units
R	Reaction time, first measurable clot formation	minutes
K	Achievement of certain clot firmness	minutes
Angle ( $\alpha$ )	Kinetics of clot development	angle in degrees
MA	Maximum amplitude, maximum strength of clot	mm
G	Strength of clot	kdyn/cm <sup>2</sup>
LY30	Percent lysis 30 minutes after MA	%



# Tracing Interpretation



Button to filter by patient, date, etc.

Button to maximize tracing (or double click on thumbnail)

Button to compare tracings

Sample information

Thumbnail of sample

Sample test results

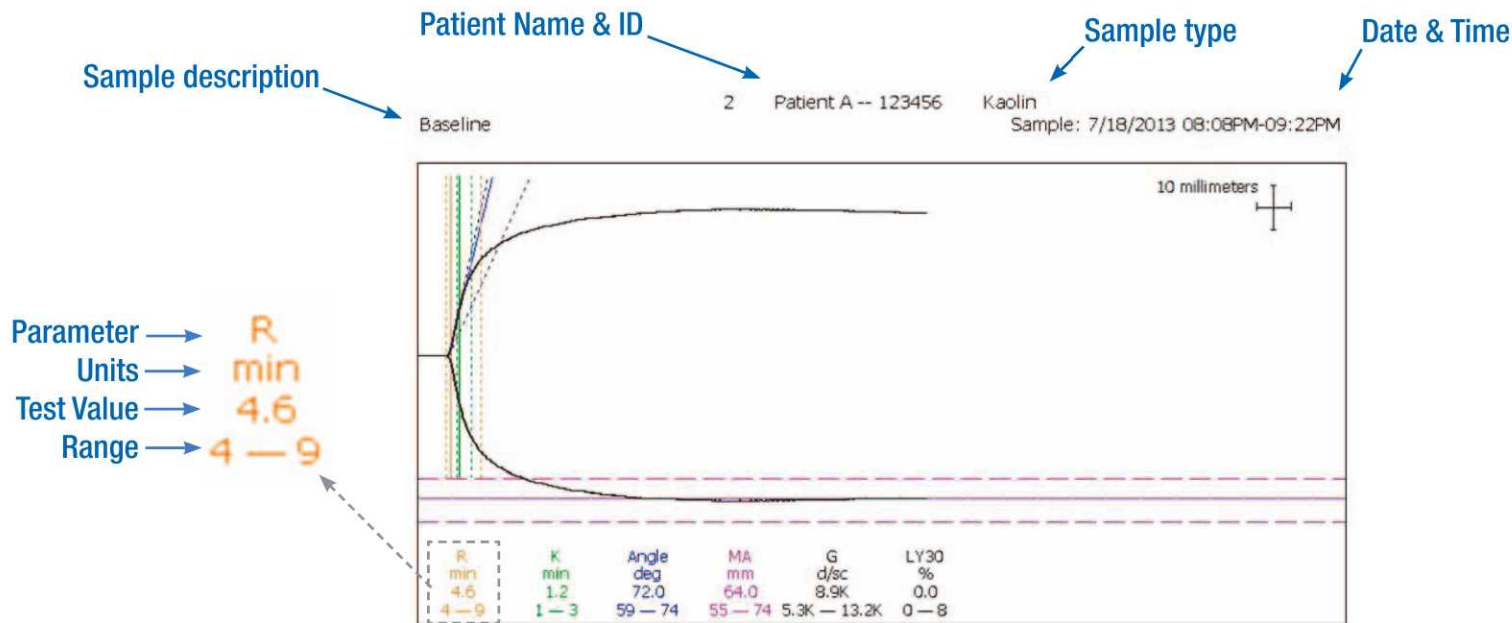
TEG® Analytical Software 4.2.3 TEG® mode C:\TEGW4 Demo\reg

File Records QC Options Help

Print Report Capture Case Start Stop Touch Scan Notes Guide eConsult Undo Logon Logoff VCurve

Patient Site Active Filter Max Multi Data PM Normal Ref Detail Snapes TEG Main

Channel	Patient name	R (min)	K (min)	Angle (deg)	MA (mm)	G (d/sc)
4	Boop, Betty [Open heart]	1.5	N/A	43.7	11.6	0.7K
7	Boop, Betty [Open heart]	1.4	3.9	48.7	36.6	2.9K
1	Boop, Betty [Open heart]	2.3	N/A	27.4	6.1	0.3K
6	Mouse, Michael (liver)					



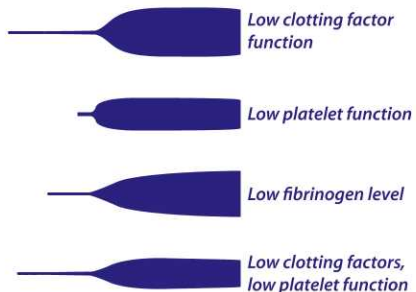
Normal Hemostasis



Normal Hemostasis



Hemorrhagic



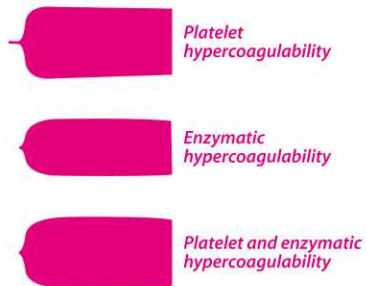
Low clotting factor function

Low platelet function

Low fibrinogen level

Low clotting factors, low platelet function

Thrombotic



Platelet hypercoagulability

Enzymatic hypercoagulability

Platelet and enzymatic hypercoagulability

Fibrinolytic



Primary fibrinolysis



Secondary fibrinolysis



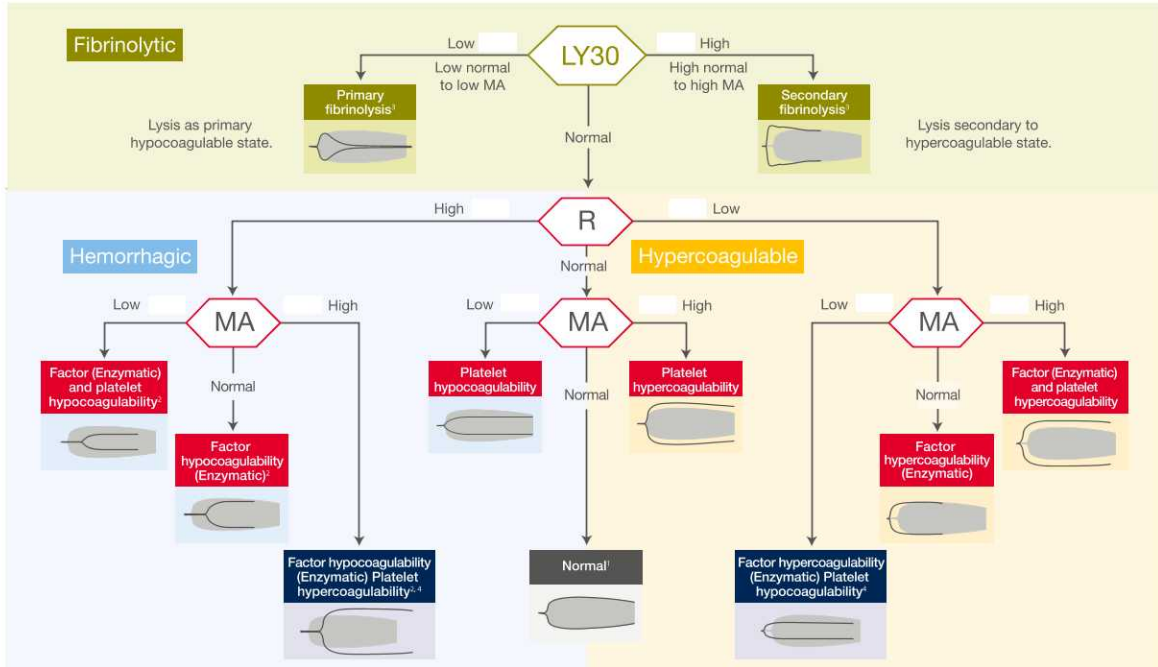
Therapy	TEG Parameter Most Affected	
Anticoagulant	↑ R	Increase R (longer)
Platelet Inhibitor	↓ MA <sub>ADP/AA</sub>	Decrease MA of ADP or AA sample in PlateletMapping® assay
Fibrinogen	↑ MA <sub>FF</sub>	Increase MA
Fibrinolytic	↑ LY30	Increase LY30
Procoagulant	↓ R	Decrease R (shorter)
Platelet Enhancer	↑ MA	Increase MA
Antifibrinolytic	↓ LY30	Decrease LY30*

\*A change in lysis will only be seen if there is significant lysis present.

# TEG Analysis Tree

The following chart also applies to Citrated Kaolin.

**K** Kaolin



P/N 06-538-US(AB)

## Additional notes for TEG Analysis Tree

**Heparinase cups:** If plain and blue cup samples were run and patient is not heparin treated, it is advised to evaluate coagulopathy based on the plain cup sample to more closely match in vivo conditions.

**Hypothermia:** If the patient is hypothermic, a split sample may be run: one sample at the patient's body temperature and a second sample at 37° C.

**Rewarming samples:** Values in the treatment are based on kaolin activated samples run at 37° C. Running samples at lower temperatures will affect parameter values and should be accounted for when using the analysis tree.

## Footnotes for TEG Analysis Tree

1. Normal results may be obtained for a bleeding patient. If normal TEG results are obtained and patient is bleeding:
  - a. **Rule out Von Willebrand factor dysfunction** - Clot formation may be normal, but clot may not adhere to the damaged vascular site due to poor platelet-to-subendothelial bonding.
  - b. **Rule out platelet dysfunction** - Use PlateletMapping assays to determine platelet function via ADP and AA.
  - c. **Mechanical bleeding** - If vWF deficiency and platelet dysfunction have been ruled out, consider surgical bleeding.
2. Increased R values in a kaolin (K) or citrated kaolin (CK) sample are seen when heparin is present. Comparing a kaolin (K or CK) sample with heparinase (KH or CKH) sample from the same blood sample will demonstrate the effect of heparin.
3. It is very important to distinguish between primary and secondary fibrinolysis as treatment regimens are significantly different.
4. This tracing demonstrates conflicting coagulopathies. The degree of each coagulopathy should be considered as well as the patient's clinical status and previous test results.

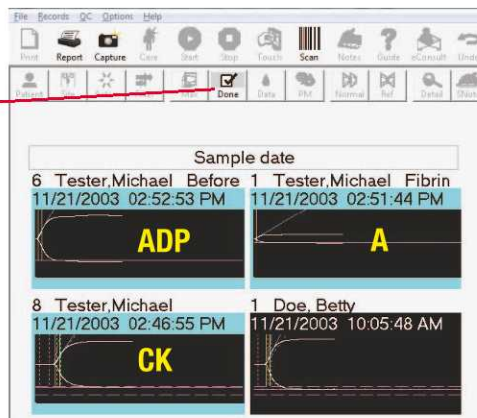
## To View Results

1. Click Multi.



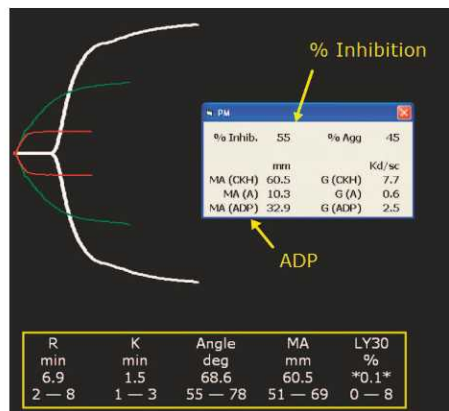
2. Select tracings in this order:
  - Kaolin (K, CK, KH, or CKH)
  - Activator (A)
  - ADP or AA

3. Click Done.

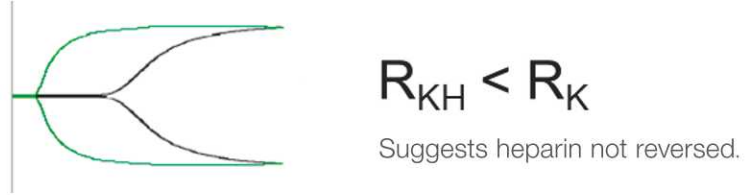


## To Assess Results

1. View the % inhibition in the PM window.
2. For underlying hemostasis, view the Kaolin results (white tracing).
3. For agonist-induced activation, view the ADP or AA results (green tracing).



## Heparin (K vs. KH)



### Legend

Green = kaolin with heparinase (KH)

Black = kaolin only (K)

# Cardiac

When	Test/Assay	Blood Sample
<p><b>Baseline</b></p> <p>Either day before or on induction Prior to heparin and hemodilution</p>	<p>PlateletMapping®</p>	<p>2 types of samples are needed for PlateletMapping®:</p> <ul style="list-style-type: none"> <li>• 1 non-heparin tube for the Kaolin test</li> <li>• 1 heparin tube for all other tests in the PLM assay</li> </ul>
<p><b>Re-warm</b></p> <p>Blood temperature 35-36° C (20 mins prior to coming off bypass)</p>	<p>Kaolin in Heparinase Cup</p>	<p>1 non-heparin tube</p>
<p><b>Post-Protamine</b></p> <p>Ten mins post protamine (same time as ACT draw)</p>	<p>Kaolin in Plain Cup Kaolin in Heparinase Cup</p>	<p>1 non-heparin tube</p>
<p><b>Post Op</b></p> <p>Two hours post protamine (ICU sample)</p>	<p>Kaolin in Plain Cup Kaolin in Heparinase Cup</p>	<p>1 non-heparin tube</p>

Trauma

Condition	TEG Test*	Guides determination of
<b>Arrival to Emergency Department</b>		
Baseline	PlateletMapping® with Kaolin Kaolin Heparinase	Coagulopathies
<b>Resuscitation and Treatment</b>		
Treatment decisions for bleeding	Kaolin	Function of hemostatic components: platelet, factor, fibrinolytic function
<b>Stabilization and Recovery</b>		
Bleeding	Kaolin	Therapy choice and effectiveness
Thrombotic	Kaolin	Therapy choice and effectiveness
Anticoagulant (Heparin, LMWH)	Kaolin vs. Kaolin Heparinase	Effect of anticoagulant
Antiplatelet therapy	PlateletMapping	Platelet function via ADP and AA

\* Kaolin and Kaolin Heparinase can be citrated.

\* A repeat TEG test should always be performed after treatment.

\* Functional Fibrinogen (FF) is an option for testing, along with Kaolin, to further assess fibrinogen function.

Parameter		TEG Result	Notes
R	Long		
	Short		
MA	Low		
	High		
LY30	High		

Test Heading		TEG Result	Notes



TEG<sup>®</sup>5000

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06.2017 USA. P/N 06-538-US(AB)

**Rx Only**



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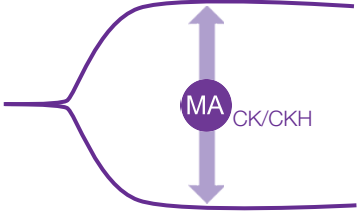

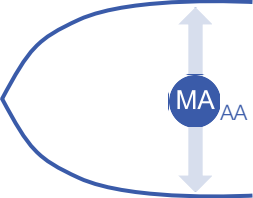
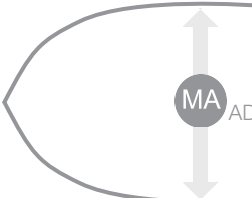
# TEG<sup>®</sup> 5000 PlateletMapping<sup>®</sup> Interpretation Guide

The PlateletMapping assay specifically determines the MA (Maximum Amplitude, a measure of clot strength) and the reduction in MA due to genetics, surgical procedures and/or antiplatelet therapy.

Inhibition is calculated automatically by comparing the MA of an agonist (AA or ADP) with that of both full platelet function and no platelet contribution.

Platelet receptor function of MA<sub>AA</sub> or MA<sub>ADP</sub> represents the contribution of platelets not inhibited and should be assessed relative to the full platelet function of MA<sub>CK/CKH</sub> and no platelet contribution of MA<sub>A</sub>.

The analyzer reports the reduction of MA as a percentage of inhibition and inversely as a percentage of aggregation.

	Clot Strength Full Platelet Function	Clot Strength No Platelet Contribution	Clot Strength AA Receptor Function	Clot Strength ADP Receptor Function
<b>Test - Parameter</b>	MA <sub>CK/CKH</sub>	MA <sub>A</sub>	MA <sub>AA</sub>	MA <sub>ADP</sub>
<b>Reagent</b>	CaCl <sub>2</sub> + Kaolin/ Kaolin Heparinase	Activator F	Activator F + AA	Activator F + ADP
<b>Hemostatic Activity</b>	Provides baseline uninhibited clot strength. Thrombin overrides the inhibitory effects of receptor specific inhibition. Also provides underlying TEG profile for identification of other suboptimal coagulative states.	Provides clot strength without platelet participation. Activator F replaces thrombin's role in the conversion of fibrinogen to fibrin and FXIII's role in cross-linking.	Provides AA induced clot strength, showing inhibitor effect from aspirin, etc. Comparison to MA <sub>CK/CKH</sub> reflects any reduction in MA due to anti-platelet therapy.	Provides ADP induced clot strength, showing inhibitor effect from clopidogrel, etc. Comparison to MA <sub>CK/CKH</sub> reflects any reduction in MA due to anti-platelet therapy.
<b>Normal Tracings</b>				

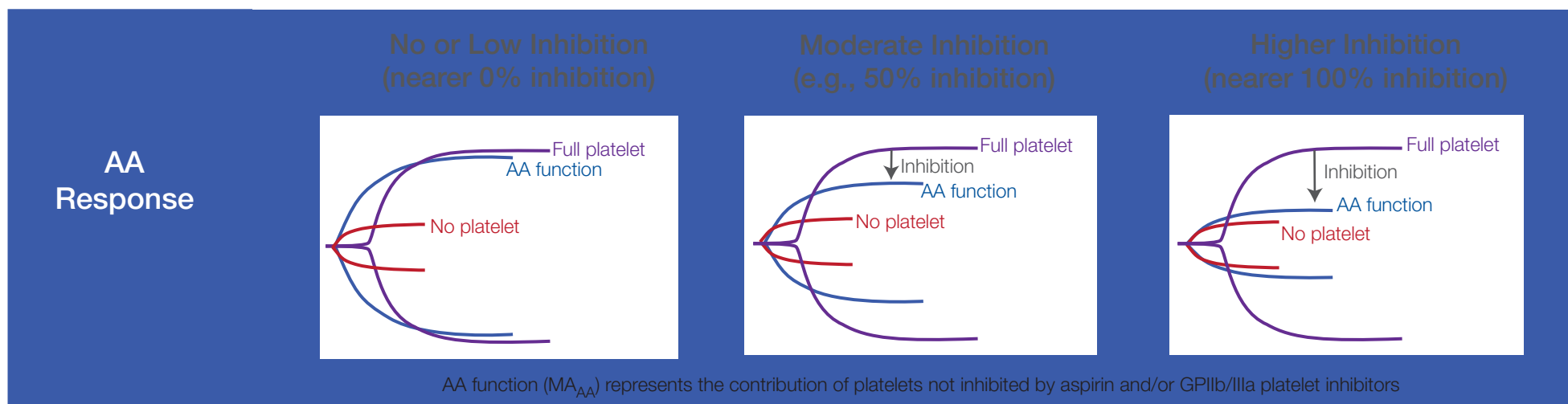
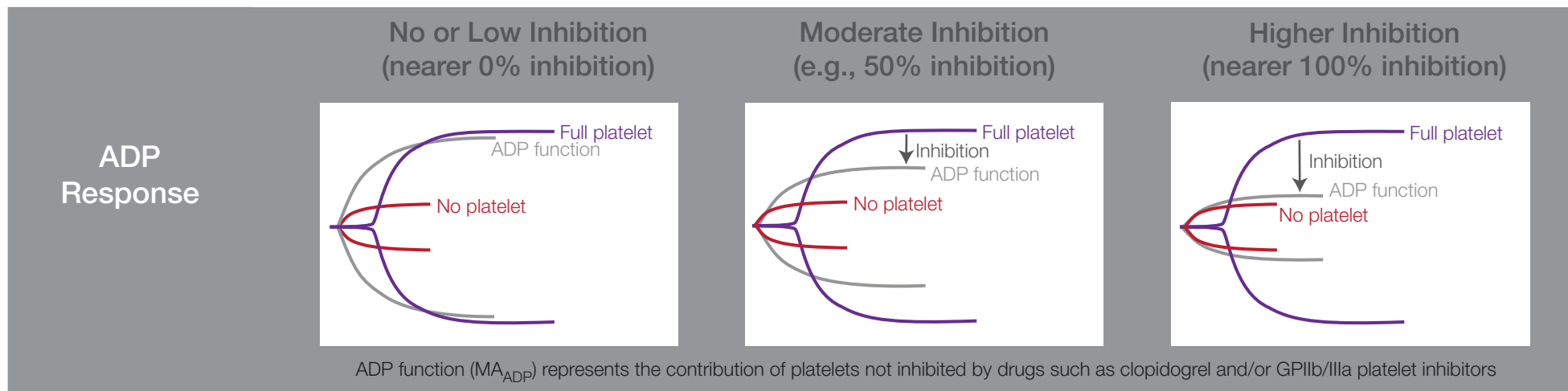
Results from the TEG analyzer should not be the sole basis for a patient diagnosis, but should be evaluated together with the patient's medical history, the clinical picture and, if necessary, other coagulation tests.



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# TEG<sup>®</sup>5000 PlateletMapping<sup>®</sup> Interpretation Guide

In general terms, the closer the ADP or AA response is to the fibrin only (no platelet contribution) result, the more inhibited that receptor is. A low % inhibition (values nearer 0%) means there is little or no effect on platelet activation. A high % inhibition (values nearer 100%) means that there is a large effect on platelet activation. The significance of inhibition will vary dependent upon the agonist, the clinical situation, the specific therapy and the underlying TEG hemostasis profile (clot rate, clot strength and clot stability).



For a list of worldwide office locations and contact information, visit [www.haemonetics.com/officelocation](http://www.haemonetics.com/officelocation)

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