Hemostasis Innovation is Here.

HEMOSIL®
D-DIMER HS

Rapid and cost-effective

For the exclusion of deep venous thrombosis and pulmonary embolism



werfen

D-dimer
in clinical practice

In the diagnosis of DVT and PE

Diagnosis of venous thromboembolism (VTE), which includes deep venous thrombosis (DVT) and pulmonary embolism (PE), often begins with a clinical evaluation, followed by D-dimer testing. Confirmatory tests generally involve imaging techniques. For DVT, these are proximal lower extremity or whole-leg ultrasound. For PE, imaging tests are computed tomography pulmonary angiography (CTPA) or ventilation-perfusion (VQ) scan.

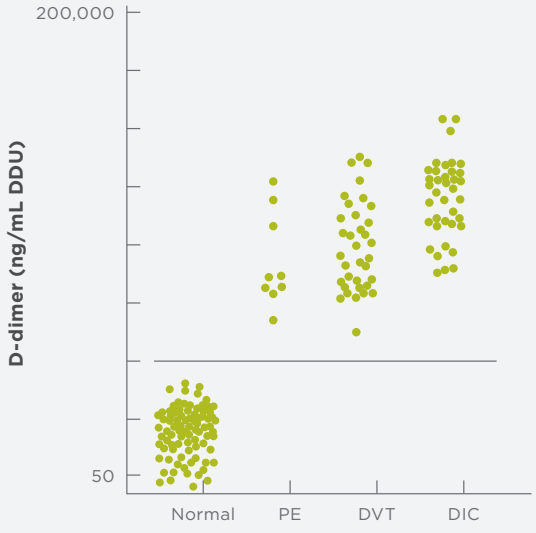
A substantial number of publications report the use of D-dimer, together with a pre-test probability (PTP) assessment model or score, as a safe, cost-effective management strategy for the evaluation of patients presenting with clinically suspected VTE. This approach allows DVT and/or PE to be excluded in outpatients with suspected VTE who have a low or moderate PTP and a negative D-dimer, reducing the number of imaging tests required.[1-3]

Other clinical applications

D-dimer testing has been evaluated in a number of clinical applications, such as predictive factors, for recurrences of VTE after discontinuation of oral anticoagulant therapy and as an indicator of pregnancy complications.[4,5] D-dimer testing is also included in definitions of clinical laboratory criteria for the diagnosis and staging of disseminated intravascular coagulation (DIC).[6,7] Other studies suggest that elevated D-dimer levels in the normal population may indicate the risk for thrombosis.[8]

Further, D-dimer levels rise with age,[2] and age-adjusted cut-off values for VTE exclusion have been shown to increase specificity and reduce the number of unnecessary imaging studies in patient populations greater than 50 years.[9-12]

D-dimer levels in VTE and DIC patient groups vs. normal subjects*



In patients with PE, DVT, and DIC, D-dimer levels are greater than the established cut-off value of 230 ng/mL DDU.

*Data on file, Werfen.

Analytical performance on the ACL TOP Family and ACL TOP Family 50 Series

Linearity	Up to 3,680 ng/mL DDU without rerun Up to 69,000 ng/mL DDU with automated rerun		
Precision	**ACL TOP Family**	**Mean (ng/mL DDU)**	**% CV (Total)**
	D-Dimer Plasma Pool	180	11.0
	Low D-Dimer Control	314	7.0
	High D-Dimer Control	677	7.0
	ACL TOP Family 50 Series		
	D-Dimer Plasma Pool	159	11.0
	Low D-Dimer Control	382	3.5
	High D-Dimer Control	832	2.9
Detection Limit	137 ng/mL DDU		
Interferences		**None up to:**	
	Hemoglobin	500 mg/dL	
	Bilirubin	18 mg/dL	
	Triglycerides	1,327 mg/dL	
	Rheumatoid Factor	1,400 IU/mL	
Stability of Opened/ Reconstituted Reagents	Latex Reagent, Buffer Calibrator	1 month at 2–8°C 3 days at 15–25°C 1 month at 2–8°C 2 months at -20°C	
Onboard Stability	Latex Reagent Buffer	4 days at 15°C 4 days at 15°C	

Fewer false positive results vs. traditional latex and ELISA methods

In a management study comparing HemosIL D-Dimer HS to a traditional, automated, latex-based assay, and an ELISA assay, HemosIL D-Dimer HS demonstrated fewer false positive patient results (n = 118) than the traditional automated, latex-based assay (n = 141) and the ELISA method (n = 145). This supports the value of the assay as a cost-effective tool for the management of VTE patients.

	HemosIL D-Dimer HS	Traditional Automated Latex	ELISA
Total number of patients with suspected VTE, tested with D-dimer	300	294*	300
Number of patients excluded for VTE (D-dimer < cut-off)	104	79	77
Number of patients undergoing investigation with imaging techniques (D-dimer > cut-off)	196	215	223
Outcome:			
Confirmed for PE	47	43*	47
Confirmed for DVT	31	31	31
False Negative for PE or DVT	0	0	0
False Positive for VTE	118	141	145

*Six samples did not report any result due to instrument errors and were excluded from the analysis; four were from patients with normal samples.

VTE management studies with HemosIL D-Dimer HS

Single-center management study

Enhancing diagnosis of PE and DVT

An outcome study was performed on 300 patients suspected of PE or DVT (26% frequency of VTE). Patient samples with positive D-dimer results were confirmed through standard imaging techniques.

Patient samples were also tested with a traditional automated, latex-based method and an ELISA assay, using manufacturer-recommended cut-off values. Results, shown below, are based on a 230 ng/mL DDU cut-off value.

VTE Performance	HemosIL D-Dimer HS	Traditional Automated Latex	ELISA
Samples (n)	300	297	300
Sensitivity (%) (95% CI)	**100** (95.4–100)	**100** (95.1–100)	**100** (95.4–100)
Specificity (%) (95% CI)	**46.8** (40.1–53.6)	**35.9** (29.6–42.6)	**34.7** (28.4–41.3)
NPV (%) (95% CI)	**100** (96.5–100)	**100** (95.4–100)	**100** (95.3–100)

Multicenter management study

Excluding PE and DVT

A multicenter management study was performed at four hospitals on 668 samples from patients suspected of PE (n = 361) or DVT (n = 307). Patient management was based on a study-specific diagnostic algorithm involving PTP scoring. Positive D-dimer results were confirmed through standard imaging techniques. Negative results were confirmed at a three-month follow-up.

For patients with a negative D-dimer result and a moderate PTP, physicians determined if a three-month follow-up or imaging studies were required. The overall prevalence in the total population was 16.1% (58/361) for PE and 20.2% (62/307) for DVT. Results, shown below, are based on a 230 ng/mL DDU cut-off value.

PE Performance	All samples	High PTP	Low + Moderate PTP
Samples (n)	361	28	333
Sensitivity (%) (95% CI)	**100** (58/58) (93.8–100)	**100** (10/10) (69.2–100)	**100** (48/48) (92.6–100)
Specificity (%) (95% CI)	**35.6** (108/303) (30.2–41.3)	**16.7** (3/18) (3.6–41.4)	**36.8** (105/285) (31.2–42.7)
NPV (%) (95% CI)	**100** (108/108) (96.6–100)	**100** (3/3) (29.2–100)	**100** (105/105) (96.5–100)

DVT Performance	All samples	High PTP	Low + Moderate PTP
Samples (n)	307	54	253
Sensitivity (%) (95% CI)	**100** (62/62) (94.2–100)	**100** (28/28) (87.7–100)	**100** (34/34) (89.7–100)
Specificity (%) (95% CI)	**38.4** (94/245) (32.2–44.8)	**34.6** (9/26) (17.2–55.7)	**38.8** (85/219) (32.3–45.6)
NPV (%) (95% CI)	**100** (94/94) (96.2–100)	**100** (9/9) (66.4–100)	**100** (85/85) (95.8–100)

HEMOSIL

D-Dimer HS

HemosIL D-Dimer HS is a fully automated, latex-enhanced immunoassay for the exclusion of VTE in outpatients suspected of PE and DVT, in conjunction with a clinical PTP assessment model, on ACL TOP and ACL TOP Family 50 Series Hemostasis Testing Systems.

The latex reagent is a suspension of polystyrene latex particles, coated with the $F(ab')_2$ fragment of a monoclonal antibody, highly specific for the D-dimer domain included in fibrin degradation products or derivatives. The use of the $F(ab')_2$ fragment allows for more specific D-dimer detection, avoiding interference from certain endogenous factors, such as rheumatoid factor.

The assay is optimized for a wavelength of 671 nm, providing a very high analytical sensitivity, enhanced working range, and minimized interference from hemoglobin.

Saves Time and Resources	Enhances Patient Care
Optimizes laboratory workload • Fully automated **Provides rapid patient response** • Results in <5 minutes **Reduces number of unnecessary imaging techniques** • High specificity and sensitivity for VTE	**Cleared by regulatory authorities for the exclusion of VTE with superior accuracy and precision** • 100% negative predictive value (NPV) • In conjunction with a PTP score, excludes PE and DVT, with a 230 ng/mL DDU cut-off value • Minimized interference from rheumatoid factor and hemoglobin

HemosIL D-Dimer HS, with a PTP score, safely excludes PE and DVT

Using a cut-off of 230 ng/mL DDU, HemosIL D-Dimer HS successfully excluded PE and DVT in more than 900 patients (two clinical studies) with an NPV of 100% and sensitivity of 100%.

Single-Center Management Study	Multicenter Management Study
• 300 outpatients • NPV = 100% • Specificity for VTE = 46.8%	• 668 outpatients • NPV = 100% • Specificity for PE = 35.6% • Specificity for DVT = 38.4%

HemosIL D-Dimer HS Kit Composition

Product	Part Number	Kit Configuration
D-Dimer HS	0020007700	3 x 2 mL Latex Reagent (lyo) 3 x 8 mL Reaction Buffer (liq) 2 x 1 mL Calibrator (lyo)
D-Dimer Controls*	0020013000	5 x 1 mL Level 1 D-Dimer Control (liq) 5 x 1 mL Level 2 D-Dimer Control (liq)
D-Dimer Controls*	0022660030	5 x 1 mL Level 1 D-Dimer Control (liq) 5 x 1 mL Level 2 D-Dimer Control (liq)

*Not available in all countries.

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