Hemostasis test results, particularly global assays such as prothrombin time (PT) or activated partial thromboplastin time (aPTT), are known to vary with the reagents and analyzers used.[7] The Perinatal and Pediatric Hemostasis Subcommittee of the SSC of the ISTH recommends that each laboratory define age-dependent reference ranges using their own methodologies.[8]

To assist labs in this endeavor, IL collaborated with six hospital laboratories to define reference ranges for the use of HemosIL assays in children.[3] The results from this collaboration[3] confirmed that most Hemostasis test results are highly dependent on age, and that age-specific reference ranges must be used to ensure proper evaluation.

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CODE

Optimizing Pediatric **Hemostasis Testing.**

About this guide

Diagnostic testing is critical to ensuring optimal patient management of hemorrhagic and thrombotic diseases in children.[1, 2] This guide presents the reference ranges of diagnostic assays for pediatric patients (ages 15 days to 17 years), as determined by a multi-center study using ACL TOP® Hemostasis Testing Systems.[3]

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Age dependency of Hemostasis parameters during childhood[3-6]

Pediatric reference ranges for HemosIL Assays on ACL TOP Hemostasis Testing Systems

Test	HemosIL Assay	15 Days–4 Weeks	1–5 Months	6–11 Months	1–5 Years	6–10 Years	11–17 Years
PT (sec)	RecombiPlasTin® 2G	11.2 [9.5 - 12.6]	11.0 [9.7 - 12.8]	11.0 [9.8 - 13.0]	11.3 [9.9 - 13.4]	11.7 [10.0 - 14.6]	11.8 [10.0 - 14.1]
aPTT (sec)	SynthASil®	35.4 [27.6 - 45.6]	33.5 [24.8 - 40.7]	32.4 [25.1 - 40.7]	31.6 [24.0 - 39.2]	31.6 [26.9 - 38.7]	31.0 [24.6 - 38.4]
aPTT (sec)	aPTT-SP	39.0 [33.2 - 45.6]	33.3 [25.0 - 43.3]	33.3 [25.0 - 43.3]	32.4 [25.7 - 38.4]	32.8 [25.5 - 42.4]	32.6 [26.1 - 47.4]
Fibrinogen (mg/dL)	Fibrinogen-C	254 [143 - 402]	226 [150 - 376]	233 [157 - 360]	273 [188 - 413]	278 [189 - 475]	266 [177 - 420]
Fibrinogen (mg/dL)	Q.F.A. Thrombin	240 [136 - 300]	210 [141 - 437]	230 [148 - 367]	260 [164 - 497]	276 [171 - 537]	248 [168 - 529]
FII (%)**	Factor II Deficient Plasma	56.3 [44.8 - 74.3]	75.0 [46.7 - 110.6]	91.5 [73.9 - 117.2]	99.0 [49.4 - 130.0]	90.0 [68.4 - 132.0]	93.5 [47.6 - 119.2]
FV (%)**	Factor V Deficient Plasma	100.0 [69.0 - 123.7]	99.5 [59.5 - 147.0]	102.0 [59.0 - 159.8]	110.5 [73.2 - 188.1]	101.0 [82.0 - 140.6]	97.0 [61.7 - 124.8]
FVII (%)**	Factor VII Deficient Plasma	75.6 [55.0 - 108.0]	88.0 [43.0 - 141.1]	88.0 [55.2 - 128.0]	82.0 [47.8 - 124.2]	77.0 [55.0 - 135.4]	81.5 [55.4 - 133.1]
FVIII (%)*	Factor VIII Deficient Plasma	95.5 [65.2 - 153.4]	84.5 [50.3 - 187.3]	75.0 [53.4 - 132.2]	95.0 [59.0 - 167.0]	86.5 [60.6 - 154.4]	93.0 [42.8 - 154.6]
FIX (%)*	Factor IX Deficient Plasma	43.5 [30.0 - 77.0]	53.0 [29.0 - 105.1]	76.5 [50.5 - 106.8]	84.0 [52.6 - 128.9]	80.0 [55.3 - 156.0]	96.5 [60.2 - 138.4]
FX (%)**	Factor X Deficient Plasma	85.0 [66.0 - 92.0]	89.0 [67.5 - 122.2]	100.0 [75.8 - 134.4]	99.0 [59.7 - 152.8]	99.0 [71.3 - 161.5]	93.0 [64.0 - 130.5]
FXI (%)*	Factor XI Deficient Plasma	56.0 [32.9 - 75.0]	64.0 [27.6 - 126.4]	86.0 [60.9 - 125.6]	92.0 [58.0 - 154.0]	83.0 [31.8 - 154.0]	84.0 [55.4 - 139.4]
FXII (%)*	Factor XII Deficient Plasma	69.2 [25.0 - 81.0]	76.0 [38.0 - 136.6]	109.2 [48.0 - 156.1]	107.0 [50.0 - 174.7]	83.7 [49.4 - 153.5]	91.7 [49.4 - 153.5]
FXIII (%)	Factor XIII Antigen	86.0 [78.4 - 100.0]	82.9 [55.3 - 133.2]	92.0 [51.1 - 136.8]	97.4 [49.4 - 137.2]	96.5 [53.5 - 142.4]	106.0 [64.4 - 133.1]
vWF:GP1bR (%)	von Willebrand Factor Ristocetin Cofactor Activity	99.6 [87.8 - 121.5]	89.0 [33.2 - 154.1]	67.1 [37.1 - 118.6]	83.3 [40.8 - 131.8]	89.1 [42.1 - 162.6]	92.8 [45.0 - 139.1]
vWF:Ab (%)	von Willebrand Factor Activity	121.5 [73.7 - 188.9]	104.0 [40.9 - 191.0]	86.0 [42.7 - 176.0]	82.4 [43.6 - 155.8]	83.0 [41.2 - 128.9]	83.5 [54.0 - 136.9]
vWF:Ag (%)	von Willebrand Factor Antigen	163.3 [46.0 - 219.5]	101.5 [35.5 - 217.0]	78.6 [48.4 - 199.4]	89.1 [41.0 - 185.7]	80.0 [44.8 - 141.1]	92.0 [55.6 - 123.4]
Antithrombin (%)	Liquid Antithrombin	41.0 [32.8 - 62.8]	80.1 [29.0 - 120.0]	96.0 [63.0 - 121.8]	96.5 [60.5 - 128.3]	97.0 [64.2 - 136.4]	97.0 [69.1 - 135.9]
PC chromogenic (%)	Protein C	39.1 [27.2 - 48.0]	51.2 [22.8 - 95.0]	79.9 [46.6 - 150.9]	92.6 [59.1 - 147.5]	100.5 [45.9 - 153.5]	99.0 [72.3 - 155.1]
PC clotting (%)	ProClot	37.5 [29.7 - 114.6]	82.0 [28.1 - 127.8]	85.0 [43.7 - 151.3]	86.3 [61.0 - 143.5]	91.0 [39.3 - 170.3]	95.1 [65.8 - 126.6]
PS Free Ag (%)	Free Protein S (antigenic immunoassay)	83.8 [61.0 - 108.0]	94.9 [48.0 - 126.5]	86.0 [63.0 - 138.9]	86.4 [53.0 - 134.9]	95.1 [61.5 - 141.7]	93.5 [61.4 - 130.7]
PS clotting (%)	Protein S Activity	90.1 [29.0 - 115.2]	81.6 [33.3 - 153.9]	88.3 [51.8 - 138.4]	97.6 [60.2 - 148.8]	104.8 [66.5 - 161.5]	99.3 [52.5 - 147.1]
Plasminogen (%)	Plasminogen	52.6 [41.0 - 82.7]	69.2 [37.6 - 109.6]	80.7 [49.3 - 126.4]	91.8 [59.6 - 178.0]	92.0 [52.4 - 158.1]	91.8 [58.1 - 130.6]
D-dimer (ng/mL FEU)	D-Dimer HS 500	530 [445 - 1200]	515 [90 - 878]	270 [133 - 844]	280 [88 - 780]	275 [60 - 567]	245 [69 - 580]

Pediatric claims have not been reviewed by regulatory agencies. Listed products should be used per labeled claims. Units of measure from publication converted to those listed on Product Insert Sheets.
*Used with SynthASil.
**Used with RecombiPlasTin 2G.