

K965076

510(k) SUMMARY

MAR 18 1997

MDA™ Heparin anti-Xa

This summary of safety and effectiveness information is being submitted in accordance with the requirements of SMMA 1990 and the final rule under 21 CFR 807.92 published December 14, 1994.

(a) (1) The submitter's name, address, telephone number, a contact person, and the date the summary was prepared;

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Date 510(k) Summary Prepared: December 17, 1996

(a) (2) The name of the device, including the trade or proprietary name if applicable, the common or usual name, and the classification name, if known;

Trade/Proprietary Name: MDA™ Heparin anti-Xa
Common/ Usual Name: Heparin assay
Classification Name: Heparin assay

(a) (3) An identification of the legally marketed device to which the submitter claims substantial equivalence.

Device Equivalent to: Stachrom® Heparin (K925433)

(a) (4) A description of the device(System)

Description of MDA Heparin anti-Xa

Heparin is administered to prevent thrombotic complications (for example, to prevent thrombosis following surgery) and to reduce or prevent the extension of existing thrombi (for example, in treatment of deep venous thrombosis). Heparin acts by binding to antithrombin III (AT-III), a plasma protein that inhibits coagulation enzymes including thrombin and FXa. Inhibition of these enzymes is greatly accelerated when AT-III is bound to heparin.

MDA Heparin anti-FXa measures the ability of heparin to accelerate AT-III inhibition of FXa using a chromogenic substrate. This substrate is a small peptide linked to a chromophore which is specifically cleaved by FXa to produce yellow color. The assay principle is based on the method of Teien and Lee (1,2) and uses a two-step reaction:

- 1) Plasma containing heparin is mixed with buffer and AT-III, and incubated with FXa reagent for a fixed period of time. Some of the FXa is inactivated:
FXa + AT-III-Heparin (complex) -----> FX-AT-III (inactive) + Heparin + residual FXa
- 2) Remaining active FXa cleaves chromogenic substrate to produce yellow color, monitored by measuring absorbance at 405 nm. The amount of color produced is proportional to the amount of FXa remaining and inversely proportional to the amount of heparin in the specimen plasma:
FXa + peptide-pNA -----> peptide + p-NO₂-aniline (yellow)

Reagents included in the assay kit include Buffer Concentrate, FXa reagent, Substrate reagent and AT-III reagent.

Until recently, the heparins used for anticoagulant therapy were high-molecular weight (~15,000-30,000 daltons) sulfated polysaccharides that could be monitored using Activated Partial Thromboplastin Time (APTT, PTT) assay, chromogenic assays, or other methods (3). Recently, low molecular weight heparins (Mr < 15,000 daltons) have become available for clinical use. These LMW heparins can be measured using chromogenic assays, but are not readily measured by APTT.

(a) (5) A statement of the intended use of the device.

Device Intended Use: MDA™ Heparin anti-X_a is a chromogenic assay for the quantitative determination of heparin anti-X_a activity in human plasma.

(a) (6) A summary of the technological characteristics of the new device in comparison to those of the predicate device.

The technological characteristics of the new device in comparison to those of the device [Stachrom® Heparin (K925433)] are given in the Table 1 below.

TABLE 1

PARAMETERS	ORGNON TEKNIKA's MDA™ Heparin anti-X _a	DIAGNOSTICA STAGO's Stachrom® Heparin
CATEGORY	MDA™ Heparin anti-X _a is a chromogenic assay.	Stachrom® Heparin assay is a chromogenic assay
INTENDED USE	MDA™ Heparin anti-X _a is a chromogenic assay for the quantitative determination of heparin anti-X _a activity in human plasma.	Stachrom® Heparin assay is a chromogenic assay for quantitative determination of the plasma level of unfractionated heparins (UFH) or low molecular weight heparins (LMWH) by the measurement of their anti-X _a activity using the amidolytic method with chromogenic substrate.
SAMPLE	Citrated Plasma	Citrated Plasma
AUTOMATION	Yes (MDA 180 Instrument)	Yes (Adaptation protocol is available on request from Diagnostica Stago)
TEIEN AND LEE METHOD	Yes (Two step chromogenic measurement based on Teien and Lee method)	Yes (Two step chromogenic measurement based on Teien and Lee method)

- (b) (1) **A brief discussion of the nonclinical tests submitted, reference, or relied on in the premarket notification submission for a determination of substantial equivalency.**

Not Applicable

- (b) (2) **A brief discussion of the clinical tests submitted, reference, or relied on in the premarket notification submission for a determination of substantial equivalency.**

Accuracy

Results from MDA Heparin anti-FX_a reagents obtained on an MDA 180 were compared with another commercial chromogenic reagent and system for specimens tested in duplicate according to NCCLS Tentative Guideline EP9-A. The following results for slope, intercept and correlation were observed for linear regression comparing MDA Heparin anti X_a (y-axis) and the reference method (x-axis):

Type of heparin therapy	n	Slope	Intercept	r
Standard heparin	90	1.06	0.00	0.954
Low molecular weight heparin	35	0.95	-0.02	0.954
All specimens	125	0.98	0.00	0.952

Precision

Total precision and within-run precision for the MDA Heparin anti-Xa assay were determined in accordance with NCCLS guideline EP5-T2. Controls were tested in duplicate on two MDA instruments twice daily. Instruments were calibrated using duplicate determinations at the beginning of each week. For each instrument, data were collected for 19-21 days, with a minimum of 38 runs and 76 measurements at each control level per instrument. The following precision was observed:

Sample	Mean (IU/ml)	SD(within-run) (IU/ml)	CV(within-run) %	SD(total) (IU/ml)	CV(total) %
1	0.193	0.012	6.1	0.018	9.6
2	0.389	0.018	4.5	0.026	6.7

- (b) (3) **The conclusion drawn from the nonclinical and clinical tests that demonstrate that the device is as safe, as effective, and performed as well or better than the legally marketed device identified in (a) (3).**

In conclusion, the MDA™ Heparin anti-X_a has successfully met all aspects of clinical testing and have demonstrated that the device is safe and effective and has performed well and is substantially equivalent to the legally marketed device [Stachrom® Heparin (K925433)].