

**510(k) Summary of Safety and Effectiveness for the
ADVIA® 1650 Chemistry Myoglobin Assay**

OCT 3 2012

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

A. 510(k) Number: k122599

B. Date of Preparation: 08/24/2012

C. Proprietary and Established Names:

ADVIA® Chemistry Myoglobin (MYO) Assay
ADVIA® Chemistry Myoglobin Calibrator

D. Applicant

Contact: Kira Gordon, PhD
Regulatory Affairs
Address: Siemens Healthcare Diagnostics, Inc
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E. Regulatory Information:

Reagent

1. Regulation section:
21 CFR §866.5680, Myoglobin immunological test system
2. Classification:
Class II
3. Product Code:
DDR
4. Panel:
Immunology

Calibrator

1. Regulation section:
21 CFR §862.1150, Calibrator, secondary
2. Classification:
Class II
3. Product Code:
JIT
4. Panel:
Clinical Chemistry

F. Predicate Device:

Reagent

1. Device Name:
ADVIA Centaur Myoglobin Reagent
2. Common Name:
ADVIA Centaur Myoglobin Reagent
3. 510(k) Number:
K974325 and k041133
4. Manufacturer:
Siemens Healthcare Diagnostics Inc.

Calibrator

1. Device Name:
Dimension Clinical Chemistry System Myoglobin Calibrator
2. Common Name:
Dimension Clinical Chemistry System Myoglobin Calibrator
3. 510(k) Number:
k984193
4. Manufacturer:
Siemens Healthcare Diagnostics Inc.

G. Intended Use:

The ADVIA® Chemistry Myoglobin assay is for *in vitro* diagnostic use in the quantitative measurement of myoglobin in human serum or plasma on the ADVIA® Chemistry systems. Measurement of myoglobin aids in the rapid diagnosis of heart or renal disease.

The ADVIA Chemistry Myoglobin calibrator is for *in vitro* diagnostic use in the calibration of ADVIA® Chemistry system for Myoglobin assay.

H. Device Description:

The Myoglobin reagents are ready-to-use liquid reagents packaged for use on the automated ADVIA 1650 Chemistry system. They are supplied as a 100 tests/wedge, 2 wedges/kit. ADVIA Chemistry Myoglobin calibrator is a single analyte, human serum based product containing myoglobin derived from human heart source. The kit consists of 1 vial each of 4 calibrator levels which are lyophilized. The target concentrations of these calibrators are 50, 100, 200, and 720 ng/mL. The volume per vial (after reconstitution with deionized water) is 1.0 mL. Deionized water is recommended to be used as a zero calibrator.

I. Test Principle:

In the ADVIA 1650 Chemistry Myoglobin assay, sample is diluted and then mixed with the R1 reagent (a buffer), followed by an addition of the R2 reagent (which contains latex particles coated with antibodies specific for myoglobin). The formation of the

antibody-antigen complex during the reaction results in an increase in turbidity, which is measured at 571 nm. By constructing a standard curve from the absorbance of standards, myoglobin concentration of sample can be determined.

J. Substantial Equivalence Information:

Reagent

Item	New Device: ADVIA 1650 Chemistry Myoglobin	Predicate Device: ADVIA Centaur Myoglobin
Analyte	Myoglobin	Same
Intended Use/Indications for Use	For <i>in vitro</i> diagnostic use in the quantitative measurement of myoglobin. Measurement of myoglobin aids in the rapid diagnosis of heart or renal disease	Same - For <i>in vitro</i> diagnostic use in the quantitative determination of myoglobin in serum or plasma and as an aid in the diagnosis of acute myocardial infarction
Measurement	quantitative	Same
Sample type	Serum , Heparinized Plasma	Same
Reference interval	< 110 ng/mL	Same
Format	Liquid	Liquid
Use of Calibrators	Yes	Yes
Analytical measuring interval	22 – 680 ng/mL	3-1000 ng/mL
Method Principle	latex-particle-enhanced immuno-turbidimetric	chemiluminescence
Reagents	Two: R1 and R2	Two: Lite reagent and Solid Phase
Instrument to be used	ADVIA Chemistry	ADVIA Centaur

Calibrator

Item	New Device: ADVIA Chemistry Myoglobin calibrator	Predicate Device: Siemens Dimension Clinical Chemistry System Myoglobin calibrator
Intended Use	for <i>in vitro</i> diagnostic use in the calibration of Myoglobin assay	Same
Instrument	ADVIA Chemistry Systems	Dimension Clinical Chemistry System
Measured Analytes (value assigned)	Myoglobin	Same
Form	Lyophilized	Liquid
Matrix	Human serum	Bovine serum

Analyte source	Derived from human source	Same
Number of levels	Five (the lowest level is a zero-level, not included)	Same
Fill Volume	1.0 mL each vial	Same

K. Standard/Guidance Document Reference

- Interference Testing in Clinical Chemistry; Approved Guideline - Second Edition (CLSI EP07-A2)
- Protocols for Determination of Limits of Detection and Limits of Quantitation; Approved Guideline (CLSI EP17-A)
- Evaluation of Precision Performance of Quantitative Measurement Methods; Approved Guideline-Second Edition (CLSI EP05-A2)

L. Performance Characteristics

Substantial equivalence was demonstrated by testing several performance characteristics including imprecision, method comparison, interfering substances and analytical range. All of the evaluation studies gave acceptable results when compared to the predicate device. These studies support that the ADVIA® 1650 Chemistry Myoglobin Assay is substantially equivalent to the predicate device.

I. Precision

Within run and Total Precision were established by assaying serum sample pools and serum based controls. Each sample was assayed 2 replicates per run, 2 runs per day, for at least 20 days (Serum Pool 1 was assayed over a period of 5 days in a separate study). Precision estimates were computed according to CLSI document EP05-A2, *Evaluation of Precision Performance of Quantitative Measurement Methods; Approved Guideline*.

Sample	# Day	# Run	# Rep	MEAN	Within Run		Between Run		Between Day		Total	
					SD	CV	SD	CV	SD	CV	SD	CV
Serum Pool 1	5	10	40	22.61	1.32	5.8	0.44	1.9	0.24	1.1	1.41	6.2
Control 1	20	40	80	60.3	1.22	2.0	1.09	1.8	1.13	1.9	1.99	3.3
Serum Pool 2	20	40	80	83.0	0.70	0.8	0.38	0.5	1.68	2.0	1.86	2.2
Control 2	20	40	80	155.0	1.08	0.7	1.32	0.9	3.31	2.1	3.73	2.4
Control 3	20	40	80	373.2	2.01	0.5	1.74	0.5	8.07	2.2	8.50	2.3
Serum Pool 3	20	40	80	395.2	2.36	0.6	1.66	0.4	7.20	1.8	7.76	2.0
Serum Pool 4	20	40	80	579.4	4.22	0.7	0.00	0.0	9.32	1.6	10.23	1.8

II. Linearity/assay reportable range

A linearity study across the entire measuring range was assessed using low and high serum pools. The low and high pools were mixed to make nine (9) intermediate levels

and additional 2 levels at the low end of the assay. All samples were tested on the ADVIA 1650 Chemistry analyzer. The range of samples tested was from 13-817 ng/mL. The observed values were compared to the expected values. Linear/measuring range of the assay is 22 to 680 ng/mL. The low end of the assay range is calculated based on the Limit of Quantitation. The high end of the assay range is based on lowest possible value of the high calibrator and linearity calculations.

III. Limit of Blank, Limit of Detection, Limit of Quantitation

The estimations of the Limit of Blank (LoB), Limit of Detection (LoD) and Limit of Quantitation (LoQ) were performed according to CLSI guideline EP17-A, *Protocols for Determination of Limits of Detection and Limits of Quantitation*, by running 160 replicates of "zero" serum pool and several serum pools with myoglobin concentration up to 4 x LOD level. Data supports the following claims: LoB = 12 ng/mL, LoD = 21 ng/mL. LoQ = 22 ng/mL

IV. Method and matrix comparison with predicate device

The performance of the ADVIA 1650 Chemistry Myoglobin assay (y) for serum samples was compared with the performance of ADVIA Centaur Myoglobin assay (x). Seventy-one serum samples were tested. One sample was removed from calculations for being out of assay range. The sample results ranged from 19.9 – 684.0 ng/mL myoglobin (x), and gave a correlation coefficient of 0.99. The results calculated using least squares linear regression (1st replicate) are as follows:

ADVIA 1650 Chemistry Myoglobin = 0.96 (predicate device) + 12.5 ng/mL

Slope 95%CI: 0.95 – 0.98

Intercept 95% CI: 8.3 – 16.7

V. Matrix comparison with predicate device

The performance of the ADVIA 1650 Chemistry assay (y) for plasma samples on ADVIA 1650 was compared with the performance of ADVIA Centaur Myoglobin assay (x). Sixty four plasma samples were tested; the sample results ranged from 18.9 – 624.1 ng/mL myoglobin (x), and gave a correlation coefficient of 0.99. The results calculated using linear regression (1st replicate) are as follows:

ADVIA 1650 Chemistry Myoglobin = 0.98 (predicate device) + 14.1 ng/mL

Slope 95%CI: 0.96 – 1.00

Intercept 95% CI: 8.1 – 20.1

VI. Analytical specificity

Interferences from icterus, lipemia, hemolysis, total protein and rheumatoid factor were evaluated in the Myoglobin assay using a significance criterion of >10% variance from the control. No significant interference was found at unconjugated bilirubin levels from 0-60 mg/dL in 50, 100, and 400 ng/mL myoglobin samples. No significant interference

was found at conjugated bilirubin levels from 0-60 mg/dL in 50, 100, and 400 ng/mL myoglobin samples. No significant lipemia interference was found at Intralipid levels from 0-1000 mg/dL in a 100 and 400 ng/mL myoglobin samples, and at Intralipid levels from 0-750 mg/dL in a 50 ng/mL myoglobin sample. No significant hemoglobin interference was found at hemoglobin levels from 0-1000 mg/dL in a 400 ng/mL myoglobin sample, at hemoglobin levels from 0-500 mg/dL in a 100 ng/mL myoglobin sample, and at hemoglobin levels from 0-250 mg/dL in a 50 ng/mL myoglobin sample. Hemolysed samples should not be used. No significant interference was found at total protein levels from 0-13 g/dL in a 50, 100, and 400 ng/mL myoglobin samples. No significant interference was found at RF levels from 0-800 U/L in a 50, 100, and 400 ng/mL myoglobin samples.

VII. Reference Range

The reference range for the assay is < 110.0 ng/mL (< 110.0 µg/L). Results above 110 ng/mL (110.0 µg/ml) are highly suggestive of an early onset of myocardial necrosis. The reference range was established previously for the predicate device. ADVIA Chemistry Myoglobin reference range is based on substantial equivalence to the predicate device (method comparison studies and the normal range verification study). Siemens provides this information for reference. As with all *in vitro* diagnostic assays, each laboratory should determine its own reference ranges for the diagnostic evaluation of patient results.

VIII. Clinical Studies

Not applicable.

IX. Clinical cut-off

Not applicable

L. Conclusion

The ADVIA 1650 Chemistry Myoglobin assay is substantially equivalent in principle and performance to other products in commercial distribution intended for similar use. Most notably, it is substantially equivalent to the currently marketed Siemens Healthcare Diagnostics ADVIA Centaur Myoglobin Assay (k041133)

The ADVIA 1650 Chemistry Myoglobin calibrator is substantially equivalent in principle and performance to other products in commercial distribution intended for similar use. Most notably, it is substantially equivalent to the currently marketed Siemens Healthcare Diagnostics Dimension Myoglobin Calibrator (k984193).

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Silver Spring, MD 20993

Siemens Healthcare Diagnostics, Inc
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OCT 3 2012

Re: k122599
Trade Name: ADVIA® Chemistry Myoglobin Assay
ADVIA® Chemistry Myoglobin Calibrator
Regulation Number: 21 CFR §866.5680
Regulation Name: Myoglobin immunological test system
Regulatory Class: Class II
Product Codes: DDR, JIT
Dated: August 24, 2012
Received: August 27, 2012

Dear Dr. Gordon:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

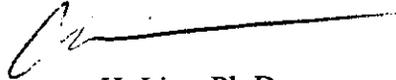
If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820).

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Office of In Vitro Diagnostic Devices and Radiological Health at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding postmarket surveillance, please contact CDRH'S Office of Surveillance and Biometric's (OSB's) Division of Postmarket Surveillance at (301) 796-576-. For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance...

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800 638-2041 or (301) 796-5680 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>

Sincerely yours,



Courtney H. Lias, Ph.D
Director
Division of Chemistry and Toxicology
Office of *In Vitro* Diagnostics and
Radiological Health
Center for Devices and Radiological Health

Enclosure

Indication for Use

510(k) Number (if known): k122599

Device Name:

ADVIA® Chemistry Myoglobin Assay

ADVIA® Chemistry Myoglobin Calibrator

Indication For Use:

The ADVIA® Chemistry Myoglobin assay is intended for *in vitro* diagnostic use in the quantitative measurement of myoglobin in human serum or plasma on the ADVIA® Chemistry systems. Measurement of myoglobin aids in the rapid diagnosis of heart or renal disease.

The ADVIA Chemistry Myoglobin calibrator is intended for *in vitro* diagnostic use in the calibration of ADVIA® Chemistry system for Myoglobin assay

Prescription Use X
(21 CFR Part 801 Subpart D)

And/Or

Over the Counter Use
(21 CFR Part 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE; CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostic Device Evaluation and Safety (OIVD)



Division Sign-Off
Office of In Vitro Diagnostic Device
Evaluation and Safety

510(k) k122599