

DEC - 6 1999

K 993309

## Summary of Safety and Effectiveness

As required by 21 CFR 807.92, the following 510(k) Summary is provided:

### 1. Submitters Information

Contact person: William J. Pignato  
Director of Regulatory Affairs

Address: Bayer Diagnostics Corporation  
63 North Street  
Medfield, MA 02052

Phone (508) 359-3825  
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Date Summary Prepared: September 30, 1999

### 2. Device Information

Proprietary Name: Bayer Diagnostics ACS:180 & ADVIA Centaur  
Troponin I Immunoassay

Common Name: Troponin I Immunological test system

Device Classification: Class II

### 3. Predicate Device Information

Name: Bayer Diagnostics ACS:180 Troponin I Immunoassay

Manufacturer: Bayer Diagnostics Corporation

### 4. Device Description

Troponin is a structural protein which regulates the contraction of striated muscle. It consists of three subunits which are located periodically along the thin filament of the myofibrils. Troponin C binds calcium, troponin T attaches to tropomyosin on the thin filament, and troponin I inhibits actomyosin ATPase.

Troponin I (TnI), an inhibitory protein of the troponin-tropomyosin complex, exists in three distinct isoforms: cardiac muscle, slow-twitch skeletal muscle, and fast-twitch skeletal muscle. The cardiac form (cTnI) is further unique having 31 additional amino acid residues on its N-terminal, not present in the skeletal forms, which allows for specific polyclonal and monoclonal antibody development. The cardiac

specificity of this isoform improves the accuracy of diagnosis in patients with acute or chronic skeletal muscle injury and possible concomitant myocardial injury, and is the basis for its selection as a cardiac marker in the diagnosis of acute myocardial infarction.

Because of its cardiac specificity and sensitivity, cTnI has been used as a reliable marker in the diagnosis of perioperative myocardial infarction in patients undergoing cardiac surgery. It also provides useful information for evaluating patients with unstable angina, a condition implying increased risk of myocardial infarction and sudden death. Unstable angina patients with minimal values of cTnI are predicted to have a higher risk of short-term mortality. As the cTnI value progressively increases, the risk of mortality increases, presumably because the amount of myocardial damage also increases. Measuring cTnI provides useful prognostic information for evaluating patients with unstable angina, permitting early identification of patients at increased risk of death.

## **5. Statement of Intended Use**

For the quantitative determination of cardiac troponin I in serum or heparinized plasma, using the Bayer Diagnostics ACS:180<sup>®</sup> (ADVIA<sup>®</sup> Centaur<sup>™</sup>) Automated Chemiluminescence Systems.

Cardiac troponin I determinations aid in the diagnosis of acute myocardial infarction and in the risk stratification of patients with non-ST segment elevation acute coronary syndromes with respect to relative risk of mortality, myocardial infarction or increased probability of ischemic events requiring urgent revascularization procedures.

## **6. Performance Characteristics**

### ***Sensitivity and Assay Reportable Range***

The ACS:180 cTnI assay measures cTnI concentrations up to 50 ng/mL ( $\mu\text{g/L}$ ) with a minimum detectable concentration (analytical sensitivity) of 0.10 ng/mL ( $\mu\text{g/L}$ ). Analytical sensitivity is defined as the concentration of cTnI that corresponds to the RLUs that are two standard deviations greater than the mean RLUs of 20 replicate determinations of the cTnI zero standard.

### ***Method Comparison***

Method comparative studies of the ACS:180 cTnI assay and ADVIA Centaur cTnI assay gave the following relationship when analyzed by least squares linear regression. A total of 381 samples in the range of 0.17 to 49.47 ng/mL were tested.

ADVIA Centaur cTnl= 1.00 (ACS:180 cTnl) +0.00, r = 0.99

## **7. Clinical Performance Characteristics**

### ***Assessment of Patients with Acute Coronary Syndromes***

In a multicenter substudy of a clinical trial designed to assess the efficacy of low molecular weight heparin in the treatment of unstable angina and non-Q wave myocardial infarction, blood specimens from 681 patients were analyzed for cardiac troponin-I. The 444 patients with levels of cardiac troponin I of at least 0.10 ng/mL had higher risk of morbidity and mortality than the 237 patients whose levels were less than 0.10 ng/mL. Cardiac troponin I levels for risk assessment were determined within 24 hours after initial patient presentation with clinical and electrocardiographic symptoms of unstable angina or non-ST segment elevation myocardial infarction. Morbidity and mortality criterion included death, development of confirmed myocardial infarction after initial hospital presentation, and the need for urgent revascularization procedures as necessitated by recurrent episodes of angina. Clinical outcomes were monitored up to 43 days from hospital presentation.

## **8. Conclusions:**

The Bayer ACS:180 and ADVIA Centaur cardiac troponin I assays have demonstrated the ability to act as an aid in the risk stratification of patients with acute coronary syndromes in addition to the approved indication of aiding in the diagnosis of acute myocardial infarction. The change in Minimal Detectable Concentration is verified by repeat analysis of the zero standard and determination of the concentration that corresponds to two standard deviations of the mean signal of that standard.



DEPARTMENT OF HEALTH & HUMAN SERVICES

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Food and Drug Administration  
2098 Gaither Road  
Rockville MD 20850

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Mr. William J. Pignato  
Director of Regulatory Affairs  
Bayer Corporation  
Business Group Diagnostics  
63 North Street  
Medfield, Massachusetts 02052-1688

Re: K993309  
Trade Name: Bayer Diagnostics ACS:180 and ADVIA Centaur Troponin I Assay  
Regulatory Class: II  
Product Code: MMI  
Dated: September 30, 1999  
Received: October 4, 1999

Dear Mr. Pignato:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we 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). 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 (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895.

A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

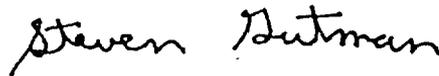
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Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770) 488-7655.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification"(21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or (301) 443-6597, or at its internet address "<http://www.fda.gov/cdrh/dsma/dsmamain.html>".

Sincerely yours,



Steven I. Gutman, M.D, M.B.A.  
Director  
Division of Clinical  
Laboratory Devices  
Office of Device Evaluation  
Center for Devices and  
Radiological Health

Enclosure

