K994221

APR 13 2000

Summary of Safety and Effectiveness

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

1. Submitter Information

Contact person:	William J. Pignato
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Date Summary Prepared:	April 5, 2000

2. Device Information

Proprietary Name:	ADVIA. Centaur and ACS: 180 ePSA Assay
Common Name:	PSA Immunoassay
Classification Name:	Reclassified to Class II, classification numbers unknown

3. Predicate Device Information

Name:	Immuno I PSA Immunoassay
Manufacturer:	Bayer Diagnostics

The Immuno 1 PSA Immunoassay was approved by FDA as PMA #P950021 and downclassified to class II by 21 CFR 866.6010, Tumor Associated Antigen Immunological Test System on Dec 17, 1997.

4. Device Description

PSA is detected in the serum of males with normal, benign hypertrophic, and malignant prostate tissue. PSA is not detected in the serum of males without prostate tissue (because of radical prostatectomy or cystoprostatectomy) or in the serum of most females. The fact that PSA is unique to prostate tissue makes it a suitable marker for monitoring men with cancer of the prostate. PSA is also useful for determining possible recurrence after therapy when used in conjunction with other diagnostic indices.

Measurement of serum PSA levels is not recommended as a screening procedure for the diagnosis of cancer because elevated PSA levels also are observed in patients with benign prostatic hypertrophy. However, studies suggest that the measurement of PSA in conjunction with digital rectal examination (DRE) and ultrasound provide a better method of detecting prostate cancer than DRE alone.

PSA levels increase in men with cancer of the prostate, and after radicalprostatectomy PSA levels routinely fall to the undetectable range. If prostatic tissue remains after surgery or metastasis has occurred, PSA appears to be useful in detecting residual and early recurrence of tumor. Therefore, serial PSA levels can help determine the success of prostatectomy, and the need for further treatment, such as radiation, endocrine or chemotherapy, and in the monitoring of the effectiveness of therapy.

5. Statement of Intended Use

The Bayer Diagnostics PSA Immunoassay is for the quantitative determination of prostate specific antigen in serum to aid in the management (monitoring) of patients prostate cancer using the Bayer Diagnostics ASC: 180 and ADVIA Automated Chemiluminescence Systems.

6. Summary of Technological Characteristics

The ACS:180 and ADVIA Centaur PSA assays are a two-site sandwich immunoassay using direct chemiluminometric technology, which uses constant amounts of two antibodies. The first antibody, in the Lite Reagent, is a polyclonal anti-goat antibody labeled with acridinium ester. The second antibody, in the Solid Phase, is a monoclonal anti-mouse antibody, which is covalently coupled to paramagnetic particles.

A direct relationship exists between the amount of PSA present in the patient sample and the amount of relative light units (RLUs) detected by the system

7. Performance Data

Sensitivity and Assay Range

The ACS: 180 PSA and ADVIA Centaur PSA assays measure total PSA concentrations up to 100 ng/mL (100 μg/L) with a minimum detectable concentration (analytical sensitivity) of 0.06 ng/mL (0.06 μg/L). Analytical sensitivity is defined as the concentration of PSA that corresponds to the RLUs that are two standard deviations greater than the mean RLUs of 20 replicate determinations of the PSA zero standard.

Accuracy and Method Comparison

For 629 samples in the range of 0.06 to 100 ng/mL (0.06 to 100 μg/L), the relationship between the ACS: 180 PSA assay and an alternate method is described by the equation:

ACS: 180 PSA = 0.98 (alternate method) + 0.0.118 ng/mL

Correlation coefficient (r) = 0.986

For 661 samples in the range of 0.06 to 100 ng/mL (0.06 to 100 μg/L), the relationship between the ADVIA Centaur PSA assay and the ACS: 180 PSA assay is described by the equation:

ADVIA Centaur PSA = 0.99 (ACS: 180 PSA) – 0.09 ng/mL

Correlation coefficient (r) = 0.990

Expected Results

To confirm the distribution of total PSA in patients, as shown below, serum samples from healthy subjects and patients with various malignant diseases were analyzed using the ACS: 180 PSA reagents. The patients included in this study represent a variety of disease states from active, progressive malignancy to no clinical evidence of disease. The frequency of positive PSA results is significantly lower in patients with no evidence of active disease compared to those with active disease.

% Distribution of PSA by Diagnostic Category

Patient Diagnosis	N	0.0-4.0 ng/mL	4.1-10 ng/mL	10.1-40 ng/mL	>40 ng/mL	Median PSA (ng/mL)
Apparently Healthy						
Female	100	100.0	0.0	0.0	0.0	< 0.06
Male < 40	71	100.0	0.0	0.0	0.0	0.73
Male 40–50	50	100.0	0.0	0.0	0.0	0.53
Male 50–60	54	100.0	0.0	0.0	0.0	0.61
Male 60–70	50	100.0	0.0	0.0	0.0	0.85
Male > 70	58	100.0	0.0	0.0	0.0	0.77
Total Males	283	100.0	0.0	0.0	0.0	0.71
Prostate Cancer						
Stage A	42	69.0	26.2	4.8	0.0	3.92
Stage B	50	60.0	32.0	8.0	0.0	3.52
Stage C	43	20.9	72.1	4.7	2.3	5.25
Stage D*	46	56.5	21.7	19.6	2.2	3.48
Total Prostate	191	51.6	38.0	9.3	1.1	4.04
Benign Diseases						
Prostate Hypertrophy (BPH)	152	46.7	32.9	20.4	0.0	4.37
Genitourinary (GU)[a]	50	90.0	8.0	2.0	0.0	1.38
Prostatitis	18	27.8	5.6	5.6	61.1	125.9
Rheumatoid Factor	5	100.0	0.0	0 0	0.0	0.58

* Six of the these samples were from untreated patients, the remaining samples were patients under treatment

% Distribution of PSA by Diagnostic Category

Patient Diagnosis	N	0.0-4.0 ng/mL	4.1-10 ng/mL	10.1-40 ng/mL	>40 ng/mL	Median PSA (ng/mL)
Other Cancers						
Breast	10	100.0	0.0	0.0	0.0	0.08
Renal	6	100.0	0.0	0.0	0.0	0.37
Pulmonary	10	100.0	0.0	0 0	0.0	0.08
Misc. GU	39	92.3	5.1	2 6	0.0	0.42
Gastrointestinal	12	91.7	0.0	0 0	8.3	0.90
Other	18	100.0	0.0	0 0	0.0	0.45

Precision

For the ACS: 180 eight samples were assayed 3 times in 6 assays, on each of 4 systems (n = 72 for each sample), over a period of 3 days. The following results were obtained:

Mean (ng/mL)	Mean (μg/L)	Within-run % CV	Run-to-run % CV	Total % CV
0.70	0.70	3.4	3.2	5.9
0.91	0.91	3.4	3.6	5.3
1.83	1.83	2.8	3.3	5.0
17.55	17.55	2.8	2.7	4.2
18.23	18.23	2.9	3.1	4.6
29.73	29.73	3.2	3.0	5.1
54.34	54.34	3.5	3.3	5.3
76.25	76.25	3.7	3.4	6.3

For the ADVIA Centaur six samples were assayed 3 times in 8 runs, on each of 4 systems (n = 24 for each sample), over a period of 3 days. The following results were obtained

Mean (ng/mL)	Mean (μg/L)	Within-run % CV	Run-to-run % CV	Total % CV
0.44	0.44	4.8	4.05	5.97
.708	,708	3.08	2.07	3.71
1.831	1.831	2.09	4.67	5.12
1.934	1.934	2.08	1.56	2.60
11.308	11.308	2.97	3.61	4.68
17.706	17.706	2.29	2.40	3.31

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

APR 13 2000

Mr. William J. Pignato
Director or Regulatory Affairs
Bayer Diagnostics Corporation
63 North Street
Medfield, Massachusetts 02052

Re: K994221
Trade Name: Bayer Diagnostics Corporation ACS: 180/ADVIA Centaur PSA Assay
Regulatory Class: II
Product Code: LTJ
Dated: March 10, 2000
Received: March 15, 2000

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.

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" (21CFR 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 Gutman

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

510(k) Number (if known): K994221

Device Name: Bayer Diagnostics ACS:180 and ADVIA Centaur PSA Assay

Indications for Use:

The Bayer Diagnostics PSA Immunoassay is for the quantitative serial determination of prostate specific antigen in human serum and to aid in the management (monitoring) of patients with prostate cancer.

Steven E. Madison

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K994221

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

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use ✓ OR Over-The-Counter Use _____
(Per 21 CFR 801.109) (Optional
Format 1-2-96)