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SmithKline Diagnostics, Inc. K960183

JUN - 7 1996

510(k) SUMMARY OF SAFETY AND EFFECTIVENESS

***FlexSure® HP* Test for IgG Antibodies to *H. pylori* in Whole Blood**

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

Manufacturer:	**SmithKline Diagnostics, Inc.** **225 Baypointe Parkway** **San Jose, CA 95134-1622** **Attention: Marshall C. McCarty**
Proprietary Name:	***FlexSure® HP***
Classification Name:	**Test for IgG antibodies to *H. pylori* in whole blood**
Intended Use:	**The *FlexSure® HP* test for IgG antibodies to *H. pylori* in whole blood is a rapid, visually read, qualitative immunochromatographic method. The test is for use by health professionals as an aid in the diagnosis of *H. pylori* infection in patients with clinical signs and symptoms of gastrointestinal disease.**
Predicate Product:	***FlexSure® HP* Test for Serum IgG Antibodies to *H. pylori;* Manufactured by SmithKline Diagnostics, Inc.**
Performance Summary:	**The SKD *FlexSure® HP* Test for IgG Antibodies to *H. pylori* in Whole Blood is substantially equivalent to the predicate device, *FlexSure® HP* Test for Serum IgG Antibodies to *H. pylori* (K934863). The performance of the *FlexSure® HP* whole blood product was verified by sensitivity, specificity and reproducibility and interference studies in symptomatic patients and volunteer blood donors, mainly asymptomatic individuals, not being treated for gastrointestinal disease. Refer to attached PERFORMANCE CHARACTERISTICS.**

Marshall C. McCarty

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1-11-96
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FlexSure® HP Test for IgG Antibodies to *H. pylori* in Whole Blood

PERFORMANCE CHARACTERISTICS

The basic methodology and format for the *FlexSure® HP* Whole Blood test were established previously with the *FlexSure® HP* Serum test. The tests differ principally in the method for sample collection and application of the sample to the Test Card. Both tests are equally effective in determining the presence or absence of IgG antibodies against *H. pylori.*

FlexSure® HP Serum Test

The performance characteristics of the *FlexSure® HP* Serum test were previously reported (Premarket Notification K934863) for a group of 551 individuals (196 symptomatic and 355 asymptomatic) by comparison with a commercial microwell ELISA serological test. After eliminating 15 samples from the calculations with indeterminate ELISA Values, in accordance with the manufacturer's instructions, the remaining 536 samples yielded a relative sensitivity of 95% (285/299), a relative specificity of 94% (222/237) and overall agreement of 95% (507/536). The *FlexSure® HP* Serum test was also compared with two other reference methods in this group of individuals: histology and ^{13}C-urea breath test.

FlexSure® HP Whole Blood Test

The *FlexSure® HP* Whole Blood test was evaluated in a multi-center trial at six different gastroenterology clinics located in the United States, Canada and the United Kingdom. A group of 173 patients who presented with gastrointestinal symptoms were evaluated with the *FlexSure® HP* Whole Blood test, the *FlexSure® HP* Serum test and upper endoscopy where multiple biopsy specimens were studied by histology and/or a urease test.

Direct comparison of the *FlexSure® HP* Whole Blood test with the *FlexSure® HP* Serum test yielded a relative sensitivity of 92%, a relative specificity of 91% and overall agreement of 92% (Table 1). After resolution of discordant serological results by histology and/or a urease test, the *FlexSure® HP* Whole Blood test had a relative sensitivity of 95%, a relative specificity of 94% and overall agreement of 95%.

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FlexSure® HP Test for IgG Antibodies to *H. pylori* in Whole Blood

Table 1
FlexSure® HP Serum Test vs. _FlexSure® HP_ Whole Blood Test
Symptomatic Patients*

		FlexSure® HP Serum +	*FlexSure® HP* Serum -	Total
FlexSure® HP Whole Blood	+	98	6	104
	-	8	61	69
		106	67	173

Relative Sensitivity:	92%
Relative Specificity:	91%
Overall Agreement:	92%

* without resolution of discordants by histology and/or urease test

In this same group of patients, the *FlexSure® HP* Whole Blood test was compared directly with histology and/or a urease test, yielding a relative sensitivity of 88%, a relative specificity of 74% and overall agreement of 82% (Table 2).

Comparison of the *FlexSure® HP* Serum test with histology and/or a urease test in these patients yielded similar results: a relative sensitivity of 92%, a relative specificity of 76% and overall agreement of 84%.

The relative specificity of any serological test, when compared directly with histology or urease tests, may be lower if the bacterium was previously eradicated or suppressed as a result of taking antimicrobial drugs in connection with other medical treatments. In addition, sampling errors may occur due to the patchy distribution of the bacteria in the gastric mucosa. It is known that atrophy of the gastric mucosa often develops in persons with chronic active gastritis due to long-term *H. pylori* infection. This may lead to reduced bacterial loads making it difficult to detect the bacterium by histology or urease tests.

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Table 2
Histology and/or Urease Test vs. *FlexSure® HP* Whole Blood Test
Symptomatic Patients

		Histology and/or Urease +	Histology and/or Urease -	Total
FlexSure® HP Whole Blood	+	84	20	104
	-	11	58	69
		95	78	173

Relative Sensitivity:	88%
Relative Specificity:	74%
Overall Agreement:	82%

The *FlexSure® HP* Whole Blood test was further evaluated in a group of 233 volunteer blood donors and yielded a relative specificity of 99% and overall agreement of 97% when compared with the *FlexSure® HP* Serum test. Since diagnostic confirmation of *H. pylori* infection by a second method was not done in this volunteer group, a meaningful determination of relative sensitivity could not be made (Table 3).

Table 3
***FlexSure® HP* Serum Test vs. *FlexSure® HP* Whole Blood Test**
Volunteer Blood Donors

		FlexSure® HP Serum +	*FlexSure® HP* Serum -	Total
FlexSure® HP Whole Blood	+	41	1	42
	-	7	184	191
		48	185	233

Relative Sensitivity:	Not Determined
Relative Specificity:	99%
Overall Agreement:	97%

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Reproducibility

Within- and *between-site* reproducibility of the *FlexSure® HP* Whole Blood test was done with fresh fingerstick blood samples from three volunteers with known levels of antibody to *H. pylori* (negative, low/borderline positive, positive). Each volunteer gave three fingerstick samples on each day of testing. The *within-site* reproducibility was 26/27 (96%) and the *between-site* reproducibility was 24/27 (89%); the reproducibility of the between-site sample sets was 9/9 for the negative, 9/9 for the positive and 6/9 for the low/borderline positive.

Interference

The *FlexSure® HP* Whole Blood test was evaluated for possible interference from visibly lipemic or hemolytic samples. Whole blood was obtained by venipuncture and stored in Vacutainer tubes containing EDTA. Each sample was spiked with cholesterol, triglycerides or hemoglobin to obtain concentrations above physiological levels. Blood samples that were positive or negative for IgG antibodies to *H. pylori* were run before and after spiking on the *FlexSure® HP* Whole Blood test. None of the biological substances tested interfered with the procedure or yielded inaccurate test results.

Cross Reactivity

The cross reactivity of the test was determined previously for the *FlexSure® HP* Serum test. Sera containing known levels of antibody against *H. pylori* were evaluated according to the method of Perez-Perez, et al., (*Ann. Int. Med.* 109:11-17, 1988) with the following bacteria:

Campylobacter jejuni	*Escherichia coli*
Campylobacter fetus	*Helicobacter mustalae*
Campylobacter coli	*Helicobacter pylori*

All species tested showed no cross reactivity, indicating that the test has high specificity for human antibodies against *H. pylori*. *Helicobacter pylori* was tested as a control and found to be reactive.