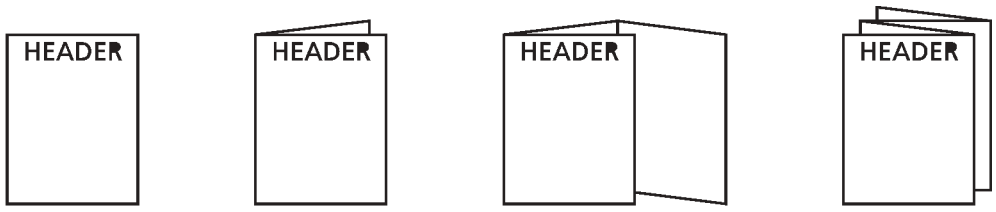
Revisions

Rev from	Rev to	ECO #
NEW	**01**	**2742-04**

Notes:

1. BD Cat. Number 256018
2. Blank (Sheet) Size : Length: 7.5" Width: 18"
   Number of Pages: 8 Number of Sheets: 1
   Page Size: Length 7.5" Width 4.5" Final Folded Size: 7.5" x 4.5"
3. Style (see illustrations below): # 4



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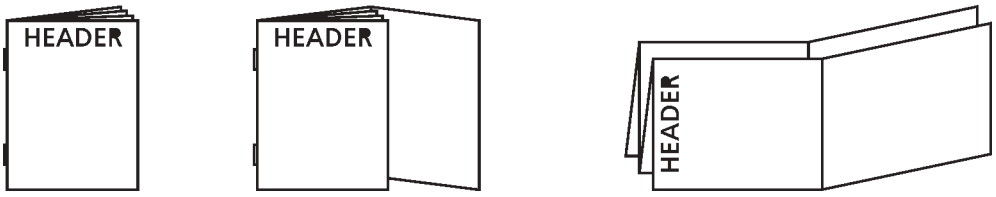

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4. See Specification Control Number OEM 32-6277 for Material Information
5. Ink Colors: Printed two sides [X] Yes [ ] No
   No. of Colors: 1 PMS# Blue 2755
6. Graphics are approved by Becton, Dickinson and Company. Supplier has the responsibility for using the most current approved revision level

Label Design Date Proofer Date Checked By Date Part Number: 32-6277		BD Becton, Dickinson and Company 7 Loveton Circle Sparks, MD 21152 USA	
	Category and Description Package Insert, BD Chek Strep A (Dipstick) Test	Sheet: 1 of 9 Scale: 1 : 1	A

BD Chek™ Strep A Test (Dipstick)

For detection of group A streptococcal antigen directly from throat swabs

32-6277/01
2004/04

INTENDED USE

The **BD Chek™** Strep A Test is for *in vitro* diagnostic use in the rapid detection of group A streptococcal antigen directly from throat swabs. The test is used to obtain a visual, qualitative result to aid in the diagnosis of group A streptococcal infection and is intended for professional use.

SUMMARY AND EXPLANATION

Beta-hemolytic group A *Streptococcus* is a major cause of upper respiratory infection such as tonsillitis, pharyngitis and scarlet fever. Early diagnosis and treatment of group A streptococcal pharyngitis has been shown to reduce the severity of symptoms and further complications, such as rheumatic fever and glomerulonephritis.[1]

Conventional methods used for the detection of the disease depend on the isolation and subsequent identification of the organism.[1,2] These methods often require 24-48 h to complete. Recent development of immunological techniques[3,4] that can detect group A streptococcal antigen directly from throat swabs, allows physicians to diagnose and administer therapy immediately.

PRINCIPLES OF THE PROCEDURE

The **BD Chek** Strep A Test utilizes a two-site sandwich immunoassay technology for the detection of group A streptococcal antigen. The test consists of a membrane strip that has been pre-coated with rabbit anti-Strep A antibody and a colored rabbit anti-Strep A polyclonal antibody-colloidal gold conjugate pad that is placed at the end of the membrane.

During testing, the Strep A antigen is extracted from the throat swab using extraction Reagents 1 and 2. The dipstick is immersed in the extracted sample. The mixture then moves chromatographically across the membrane to the immobilized rabbit anti-Strep A antibody at the test line region. If Strep A antigen is present in the specimen, a colored sandwich of antibody / Strep A antigen / gold conjugate antibody is formed on the test line. Absence of a colored line at the test line region indicates a negative result.

Regardless of the presence of Strep A antigen, the extracted mixture will continue to move laterally across the membrane to the control line region. A colored line at the control region will always appear. The presence of this colored line serves as verification that sufficient volume has been added and proper flow occurred.

REAGENTS

BD Chek Strep A Kit

Dipsticks (25), each individually packed dipstick containing a membrane strip that has been pre-coated with rabbit anti-Strep A and a colored rabbit anti-Strep A polyclonal antibody-colloidal gold conjugate pad.

Reagent 1 (12 mL), Extraction, 5M sodium nitrite.

Reagent 2 (12 mL), Extraction, 0.03M citric acid.

Control + (2 mL), Positive Control, heat-killed group A *Streptococcus* in solution (1×10^8 organisms/mL) with 0.1 % sodium azide (preservative).

Control – (2 mL), Negative Control, heat-killed group B *Streptococcus* in solution (1×10^8 organisms/mL) with 0.1 % sodium azide (preservative).

Extraction tubes (25), in zip bag.

Polyester Swabs (25), sterile, individually packed.

Plastic Workstation (1); reusable, for 5 tests at a time.

Instructions and Procedure Card.

Warnings and Precautions

For *in vitro* Diagnostic Use.

For professional and laboratory use only.

1. Do not use the kit if the Control + and Control - do not yield appropriate results.
2. Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. "Standard Precautions"[5-8] and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids.

3. Do not use kit components beyond the expiration date.
4. Do not mix reagents from different kit lot numbers or mix reagent bottle caps. Do not reuse dipstick.
5. The extraction Reagents 1 and 2 are slightly caustic. Avoid contact with eyes or mucous membranes. In the event of accidental contact, wash area thoroughly with water.
6. Positive and Negative Controls contain sodium azide which may react with lead or copper plumbing to form potentially explosive metal azides. When disposing of these solutions, always flush with copious amounts of water to prevent azide build-up.
7. Standard guidelines for handling infectious agents and chemical reagents should be observed throughout all procedures. All contaminated waste such as swabs, Strep A test dipsticks and extracts should be properly disposed.
8. Package insert instructions must be followed to obtain accurate results.
9. The pouch containing the dipstick should be sealed. Discard the test device if the package is ripped or torn.

Storage and Handling: The test kit can be stored either refrigerated or at room temperature 2-30°C for the duration of the shelf life. Do not use the kit beyond the expiration date.

SPECIMEN COLLECTION

Follow standard clinical methods described by Facklam[1] and Ross.[9] To collect throat specimens, hold down the tongue with a depressor and rub the swab on the tonsils, or any areas of inflammation with signs of pus or redness in the back of the throat. Avoid touching the tongue or sides of the mouth with the swab.

It is recommended that swab specimens be processed as soon as possible after collection. If swabs are not processed immediately they should be placed into a dry, sterile, and tightly sealed plastic tube for storage. Swab specimens can be stored at room temperature 20-30ºC for up to 4 h or refrigerated 2-8ºC for up to 24 h. If a liquid transport method is employed, use Liquid Stuart's Transport Medium or Liquid Amies Medium as outlined in the manufacturer's instructions. Do not use charcoal or agar media.

BD Chek Strep A Test requires the use of the sterile polyester swab supplied with the kit. If a bacterial culture is desired, gently streak the swab on a 5% sheep blood agar plate before testing. The extraction reagents will kill the bacteria on the swab and make it impossible to culture. Alternatively, a dual swab procedure or a subsequent second swab specimen may be collected for the culture.

PROCEDURE

Materials Provided: See "Reagents" section for reagents provided.

Materials Required But Not Provided:

Clock, timer or stopwatch.

Notes:

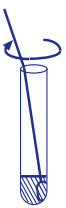
- If refrigerated, bring the wrapped dipsticks to room temperature (20-30°C) before opening the protective pouches to avoid moisture condensation on the membrane. Patient samples and controls should also be brought to room temperature prior to testing.
- Review SPECIMEN COLLECTION instructions.
- Do not open packaged dipsticks until ready to perform assay.
- To avoid cross contamination, do not allow the tips of the reagent bottles to come in contact with sample swabs or the Extraction tubes.

Test Procedure

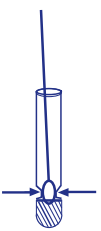
1. Remove the **BD Chek** Strep A Test dipstick from its protective pouch. Place the Extraction tube in the workstation.

2. Add 3 drops of extraction Reagent 1 to the Extraction tube. The reagent should be purple-to-pink in color.

3. Add 3 drops of extraction Reagent 2 to the Extraction tube. The solution must turn yellow in color.



4. Place the throat swab specimen in the Extraction tube. Rotate the swab inside the tube. Wait for a minimum of 1 min. You may leave the Extraction tube for up to 15 min at room temperature.



5. Squeeze the swab firmly against the tube to expel as much liquid as possible from the swab. Discard the swab.

6. Immerse the dipstick into the Extraction tube with the arrows pointing toward the extracted sample solution. Leave the dipstick in the Extraction tube.

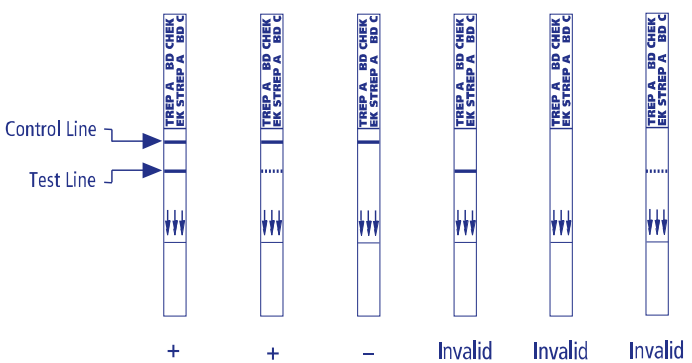
7. Read results in 5 min. Depending on the number of organisms on the swab, a positive result may be visible as soon as 1 min. However, to confirm a negative result the complete reaction time of 5 min is required. Do not read results after 10 min.

Interpretation of Test Results

Positive: Two colored lines appear. In addition to a pink colored line in the control region, a pink colored line will also appear in the test region. The color intensities of the lines may vary. A positive result indicates that the specimen contains Strep A antigen. **All lines, regardless of intensity should be interpreted as lines. Line color and intensity may vary from sample to sample.**

Negative: Only one pink colored line appears in the control region. No apparent pink colored line is visible in the test region. A negative result indicates that there is no Strep A antigen in the swab sample or the Strep A antigen concentration is below the detection level.

Invalid: No pink colored line appears in the control region. An absence of the control line is an indication of a procedural error or possible reagent deterioration. Repeat the test with a new test strip. If the problem persists, do not report patient results. Call Technical Services at (800) 638-8663. **All lines, regardless of intensity should be interpreted as lines. Line color and intensity may vary from sample to sample.**



Note: All lines, regardless of intensity should be interpreted as lines. Line color and intensity may vary from sample to sample.

QUALITY CONTROL

Internal Procedural Controls: A procedural control is built into each dipstick. The appearance of a line in the control region assures the correct test procedure was followed, indicating sufficient volume of fluid was used and that capillary flow occurred. At the end of 5 min, formation of a control line verifies the sample has flowed through the test region and the test is complete. The test is invalid if the control line does not appear.

Good laboratory practice recommends the use of control materials. Users should follow the appropriate federal, state and local guidelines concerning the running of external quality controls.

Kit Quality Controls: These controls are bacteria-based and tested like a patient sample. When testing controls, add 3 drops of extraction Reagent 1 and 3 drops of extraction Reagent 2 to the Extraction tube. Then add 1 drop of Positive or Negative Control to the Extraction tube. Place a sterile swab into the tube and swirl. Continue with Test Procedure Step 5.

A positive result is indicated by two lines, one in the control region and one in the test region. A negative result is indicated by only one line in the control region. Observe results at 5 min and do not interpret after 10 min.

If the controls do not perform as expected, do not interpret the test results. Repeat the test or contact Technical Services.

The positive and negative external controls should be tested for each new lot, new shipment or new operator.

LIMITATIONS OF THE PROCEDURE

1. The accuracy of the test depends on the quality of the swab sample. False negatives may result from improper sample collection or storage. A negative result may be obtained from patients at the onset of the disease due to low antigen concentration. Therefore, when a patient suspected of having Strep A pharyngitis has a negative **BD Chek** Strep A Test result, additional testing using the culture method is recommended.
2. The test does not differentiate asymptomatic carriers of group A *Streptococcus* from those with infection. If clinical signs and symptoms are not consistent with laboratory test results, a follow-up throat culture is recommended.
3. Respiratory infections, including pharyngitis, can be caused by streptococci from serogroups other than group A, as well as by other pathogens.
4. It is not known how the test will perform in the presence of F*usobacterium necrophorum*.
5. In rare cases, test specimens heavily colonized with *Staphylococcus aureus*, may show a very thin sharp line in the test region that is unlike the thick line that is seen in the test region with the positive control and other group A streptococcal strains. If clinical signs and symptoms are not consistent with clinical test results, a follow-up culture procedure is recommended.
6. As with all diagnostic tests, a definitive clinical diagnosis should not be based on the results of a single test, but should only be made by a physician after all clinical and laboratory findings have been evaluated.

EXPECTED RESULTS

It is estimated that approximately 19% of all upper respiratory tract infections are caused by group A streptococci.[10] Infection is most prevalent in winter and early spring, with most cases arising in patients living in highly populated areas.

PERFORMANCE CHARACTERISTICS

Clinical Performance: A correlation study between the **BD Chek** Strep A Test and the conventional culture was performed in multi-center clinical evaluations. Throat swab specimens were taken from children and adults exhibiting symptoms of pharyngitis. The swabs were then used to inoculate blood agar plates prior to testing with the **BD Chek** Strep A Test. Beta-hemolytic colonies from the blood agar plates were confirmed as group A *Streptococcus* using serologic streptococcal grouping methods. Strep A was reported as present or not present.

The results are summarized in Table 1.

Table 1: Correlation Test Results of BD Chek Strep A

		Swab culture	
		+	–
BD Chek™ Strep A Test Dipstick	+	98	2
	–	5	200

Sensitivity = 98/103 = 95.1% (95% confidence interval = 90.9-99.3%)

Specificity = 200/202 = 99.0% (95% confidence interval = 97.9-100%)

Accuracy = 298/305 = 97.7%

Reproducibility: An evaluation of **BD Chek** Strep A Test was conducted at three sites by laboratory personnel using a panel of coded dried swab samples containing Negative Control (5 x 10^6 organisms / test group B *Streptococcus*), Low Positive (5 x10^4 organisms / test) and Positive (1.5 x 10^5 organisms / test) specimens. A total of 135 coded specimens were tested over a period of three days at three sites. Over 99% agreement with the expected results was obtained.

Analytical Studies

Analytical Sensitivity (Limit of Detection): To determine the analytical sensitivity of the **BD Chek** Strep A Test, group A *Streptococcus* bacteria were grown by standard culture techniques. The detection limit of the **BD Chek** Strep A Test was determined to be 5 x 10^4 organisms per test.

Analytical Specificity: To determine the specificity of the **BD Chek** Strep A Test to group A streptococcal bacteria, various group A streptococcal strains at different levels of organisms per test were examined. Positive results obtained at a level of 5 x 10^4 organisms/test for all tested strains indicated that **BD Chek** Strep A Test was sensitive to group A streptococcal bacteria.

Cross-reactivity studies with organisms likely to be found in the respiratory tract were also performed using the **BD Chek** Strep A Test. The following organisms were tested at 1 x 10^8 organisms/test.

Group B *Streptococcus*	*Candida albicans*
Group C *Streptococcus*	*Corynebacterium diphtheriae*
Group D *Streptococcus*	*Escherichia coli*
Group F *Streptococcus*	*Haemophilus parahaemolyticus*
Group G *Streptococcus*	*Moraxella catarrhalis*
Streptococcus agalactiae	*Neisseria gonorrhoeae*
Streptococcus dysgalactiae	*Neisseria lactamica*
Streptococcus faecalis	*Neisseria meningitidis*
Streptococcus faecium	*Neisseria sicca*
Streptococcus oralis (formerly *mitis*)	*Neisseria subflava*
Streptococcus mutans	*Proteus vulgaris*
Streptococcus pneumoniae	*Pseudomonas aeruginosa*
Streptococcus salivarius	*Staphylococcus aureus*
Streptococcus sanguis	*Staphylococcus epidermidis*
Arcanobacterium haemolyticum	*Staphylococcus saprophyticus*
Bordetella pertussis	*Yersinia enterocolitica*

Staphylococcus aureus was tested at a concentration of 1 x 10^7 organisms / test.

The **BD Chek** Strep A Test gave negative results for all organisms listed.

AVAILABILITY

Cat. No.	Description
256018	**BD Chek™** Strep A 25 Test Kit (CLIA Waived)
256017	**Directigen™** EZ Strep A 30 Test Kit

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1. Facklam, R. R. and Carey, R. B., 1985. Streptococci and Aerococci, Manual of clinical microbiology, 4th ed., Lennette, E.H., Balows, A., Hausler, W.J. and Shadomy, H.J. (eds), American Society for Microbiology.
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9. Ross, P.W., 1971. Throat swabs and swabbing technique, The Practitioner *207*:791-796.
10. Lauer, B. A., Rellar, L. B. and Mirrett, S., 1983. Effect of atmosphere and duration of incubation on primary isolation of group A streptococci from throat cultures, J. Clin. Microbiol. *17*:338-340.

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