Cepheid

Instructions for Use

Xpert® Xpress GBS

For use with GeneXpert® System with Touchscreen

Catalog Numbers

REF XPRSGBS-10

303-1853 | Rev. B | 2024-05

℞only IVD *In Vitro* Diagnostic Medical Device

Trademark, Patents and Copyright Statements

See Revision History for a description of changes.

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Product Information

Proprietary Name

Xpert® Xpress GBS

Common or Usual Name

Xpert Xpress GBS

Intended Use, Summary, and Principle of Procedure

Intended Use/Indications for Use

The Xpert® Xpress GBS test, performed on the GeneXpert® Instrument Systems, is an automated, real-time PCR test for the qualitative detection of Group B *Streptococcus* (GBS) DNA from vaginal/rectal swab specimens collected from pregnant patients for intrapartum testing at term (e.g., >37 weeks) who have unknown or unavailable antepartum GBS screening test results and no additional risk factors that would warrant empiric antibiotic prophylaxis. The Xpert Xpress GBS test performed during intrapartum is intended to aid in the detection of GBS colonization in patients presenting in labor who may be candidates for antibiotic prophylaxis.

The Xpert Xpress GBS test does not provide antimicrobial susceptibility test results. Culture is necessary to obtain isolates to perform susceptibility testing as recommended for penicillin-allergic patients.

This test is conducted using direct specimen without enrichment (enrichment is recommended to enhance detection of GBS colonization). In contrast to a positive test result, which can indicate colonization, a presumptive negative result cannot exclude the possibility of GBS colonization. A false negative test result at intrapartum carries a potential harm to the infant if it is used in making decisions regarding empiric antibiotic prophylaxis. Providers must use caution and default to known patient risk factors and clinical guidance regarding a role for intrapartum prophylaxis.

Summary and Explanation

GBS bacterial infection is associated with serious illness in newborns born to patients who are colonized with the microorganism. GBS infection is the major cause of death in newborns who develop sepsis, pneumonia, or meningitis.[1,2] About half of patients who are colonized with GBS will transmit the bacteria to their newborns. Transmission of GBS usually occurs during labor or after rupture of membranes.

Currently, the standard of care for preventing neonatal GBS disease is either antepartum screening of pregnant patients at 36 0/7 and 37 6/7 weeks of gestation or intrapartum screening during labor to determine their GBS colonization status.[1,2] Most antepartum GBS testing is performed by culture, or a nucleic acid amplification test (NAAT) performed on an enrichment broth culture after 18 – 24-hour incubation[3], which typically takes one to three days to finalize results. This timing might be adequate for obtaining antepartum GBS results; however, some patients may not have GBS results available at the onset of labor. For patients who have had no prenatal care, or who might deliver preterm, or whose GBS test results are unknown at the time of delivery, intrapartum testing performed directly from a non-enriched swab specimen can provide results in time to decide whether to administer antibiotics before delivery.

The potential impact of intrapartum testing is decreased use of unnecessary antibiotics in patients not otherwise indicated for prophylaxis and the potential effect on the intestinal microbiota of infants[4], while providing adequate treatment of GBS-colonized patients with the resulting decreased risk of neonatal sepsis or meningitis[5]. Effective intrapartum GBS testing for pregnant patients who come to labor and delivery at term with no known risk factors, and without a known GBS status requires prompt specimen collection and capability of providing results quickly enough to initiate the recommended duration of antibiotic prophylaxis prior to delivery.

Principle of the Procedure

The Xpert Xpress GBS test is an automated *in vitro* diagnostic test for qualitative detection of DNA from Group B *Streptococcus* (GBS). The test is performed on the Cepheid GeneXpert Instrument Systems. The primers and probes in the Xpert Xpress GBS test are designed to amplify and detect unique sequences in two GBS chromosomal targets – the first is a target within a coding region for a glycosyl transferase family protein and the second target is within a coding region for a *LysR* family transcriptional regulator of *Streptococcus agalactiae* DNA.

The GeneXpert Instrument Systems automate and integrate sample processing, nucleic acid purification and amplification, and detection of target sequences in simple or complex samples using real-time PCR Polymerase Chain Reaction (PCR). The GeneXpert systems consist of an instrument, computer, and preloaded software for running tests and viewing the results. The systems require the use of single- use disposable cartridges that contain the PCR reagents and host the PCR process. Because the cartridges are self-contained, cross-contamination between samples is minimized. For a full description of the systems, refer to the *GeneXpert System with Touchscreen Operator Manual*.

The Xpert Xpress GBS test includes reagents for the direct detection of GBS target DNA from vaginal/rectal swabs specimens. A Sample Processing Control (SPC), a Sample Adequacy Control (SAC) and a Probe Check Control (PCC) are also included in the cartridge utilized by the GeneXpert instrument. The SPC is present to controls for adequate processing of the sample and to monitor for the presence of potential inhibitor(s) in the PCR reaction. The SPC also ensures that the PCR reaction conditions (temperature and time) are appropriate for the amplification reaction and that the PCR reagents are functional. The SAC detects the presence of the human hydroxymethylbilane synthase (HMBS) gene and ensures that sufficient sample is collected and contains adequate human DNA. The PCC verifies reagent rehydration, PCR tube filling, and confirms that all reaction components are present in the cartridge including monitoring probe integrity and dye stability.

The dual vaginal/rectal swab specimen is collected from pregnant patients at intrapartum and placed into a transport tube containing Liquid Stuart Medium. After collecting and transporting a swab sample to the

GeneXpert testing area, testing is performed by directly inserting the swab into the sample chamber of the Xpert Xpress GBS cartridge. The GeneXpert cartridge is loaded onto the GeneXpert Instrument System platform, which performs hands-off, automated sample processing, and real-time PCR for detection of GBS DNA.

The Xpert Xpress GBS has an Early Assay Termination (EAT) function that provides earlier time to result in high titer specimens if the signal from the GBS target reaches a pre-determined threshold before the full 45 PCR cycles have been completed. When GBS titers are high enough to initiate the EAT function, the SPC and SAC amplification curves may not be seen, and their results may not be reported.

Reagents, Instruments, and Materials

Reagents

Materials Provided

The Xpert Xpress GBS kit (XPRSGBS-10) contains sufficient reagents to process 10 patient or quality-control specimens. The kit contains the following:

Xpert Xpress GBS with Integrated Reaction Tubes	10 per kit
• Bead 1, Bead 2, Bead 3 (freeze-dried)	1 each per cartridge
• Reagent 1 (Tris-Chelating Agent with detergent)	3 mL per cartridge
• Reagent 2 (Sodium Hydroxide)	1.5 mL per cartridge

CD-1 per kit

- Assay Definition file (ADF)
- Instructions to import ADF into GeneXpert software
- Instructions for Use (Package Insert)

Note Safety Data Sheets (SDS) are available at www.cepheid.com or www.cepheidinternational.com under the **SUPPORT** tab.

Note The bovine serum albumin (BSA) in the beads within this product was produced and manufactured exclusively from bovine plasma sourced in the United States. No ruminant protein or other animal protein was fed to the animals; the animals passed ante- and post-mortem testing. During processing, there was no mixing of the material with other animal materials.

Materials Required but Not Provided

- GeneXpert system with touchscreen: GeneXpert instrument, touchscreen unit with built-in scanner, Cepheid OS software version 2.0 or higher, and *GeneXpert System with Touchscreen Operator Manual*.
- Printer: If a printer is required, contact Cepheid Technical Support to arrange for the purchase of a recommended printer.

- Cepheid Collection Device (catalog number 900-0370)

Materials Available but Not Provided

- Printer: If a printer is required, contact Cepheid Technical Support to arrange for the purchase of a recommended printer.

Warnings and Precautions

General

- For *in vitro* diagnostic use. Rx only
- Recommend culture for confirmation of GBS colonization when GBS PRESUMPTIVE NEGATIVE result is reported and information on GBS colonization status may be clinically needed.
- Treat all biological specimens, including used cartridges and reagents, as if capable of transmitting infectious agents. Since it is often impossible to know which specimen might be infectious, all biological specimens should be treated with standard precautions. Guidelines for specimen handling are available from the U.S. Centers for Disease Control and Prevention[6] and the Clinical and Laboratory Standards Institute[7].
- Follow your institution's safety procedures for working with chemicals and handling biological samples.
- Biological specimens, transfer devices, and used cartridges should be considered capable of transmitting infectious agents requiring standard precautions. Follow your institution's environmental waste procedures for proper disposal of used cartridges and unused reagents. These materials may exhibit characteristics of chemical hazardous waste requiring specific national or regional disposal procedures. If national or regional regulations do not provide clear direction on proper disposal, biological specimens and used cartridges should be disposed per WHO [World Health Organization] medical waste handling and disposal guidelines.
- Follow good laboratory practices. Change gloves between handling each patient specimen in order to avoid contamination of specimens or reagents. Regularly clean the work surface/areas.
- Wear protective disposable gloves, laboratory coats and eye protection when handling specimens and reagents. Wash hands thoroughly after handling specimens and test reagents.
- Clean the work surface/areas with 10% bleach before and after processing Xpert Xpress GBS specimens.
- In the event of contamination of the work area or equipment with samples or controls, thoroughly clean the contaminated area with a freshly prepared solution of 0.5% sodium hypochlorite (or a 1:10 dilution of household chlorine bleach). Follow by wiping the surface with 70% ethanol. Let work surfaces dry completely before proceeding.
- Specimens can contain high levels of organisms. Ensure that specimen containers do not contact one another. Change gloves if they come in direct contact with the specimen and after the processing of each specimen to avoid contaminating other specimens.

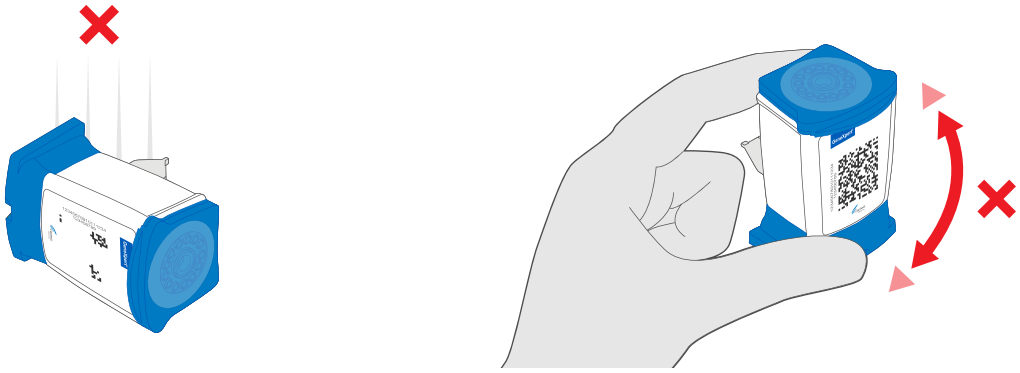
Specimens

- Maintain proper storage conditions during specimen transport to ensure the integrity of the specimen (see , Specimen Collection, Transport and Storage). Specimen stability under shipping conditions other than those recommended has not been evaluated.
- Reliable results are dependent on adequate specimen collection, transport, storage, and processing. Incorrect test results may occur from improper specimen collection, handling or storage, technical error,

sample mix-up or because the number of organisms in the specimen is below the limit of detection of the test. Careful compliance with the Instructions for Use and the *GeneXpert System with Touchscreen Operator Manual* are necessary to avoid erroneous results.

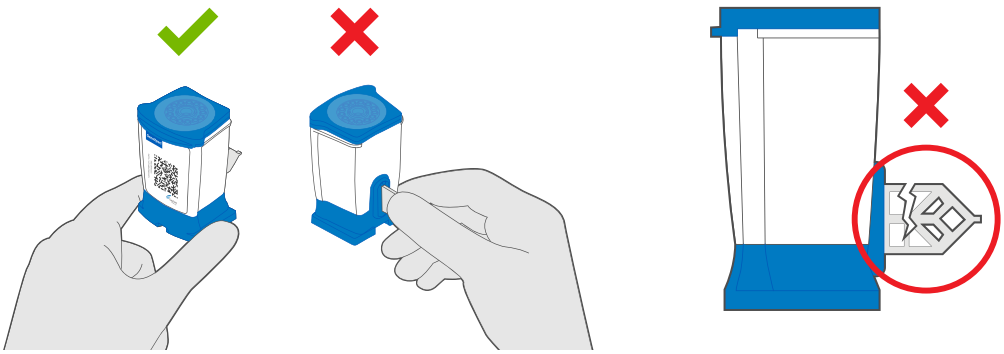
Test /Reagent

- Do not open the Xpert Xpress GBS cartridge lid except when adding specimen.
- Do not use a cartridge that has been dropped after removing from the kit or that has been shaken after the cartridge lid has been opened. Shaking or dropping the cartridge after opening the lid may yield false or non-determinate results.



- Do not place the sample ID label on the cartridge lid or on the barcode label on the cartridge.

- Do not use a cartridge with a damaged barcode label.
- Hold the cartridge by the base. Do not touch the reaction tube at the rear of the cartridge, as this could cause damage that would interfere with light passing through it during the test. Do not use a cartridge that has a damaged reaction tube.



- Do not use a visibly damaged cartridge.

- Each single-use Xpert Xpress GBS cartridge is used to process one test. Do not reuse processed cartridges.
- Do not use a cartridge if it appears wet or if the lid seal appears to have been broken.

Chemical Hazards, Storage and Handling

Chemical Hazards[7,8]

Reagent 2 (Sodium Hydroxide)

- **UN GHS Signal Word:** WARNING
- **UN GHS Hazard Pictogram(s):** 
- **UN GHS Hazard Statements**
  - Causes skin irritation
  - Causes serious eye irritation
- **UN GHS Precautionary Statement(s)**
  - **Prevention**
    - Wash thoroughly after handling.
    - Wear protective gloves/protective clothing/eye protection/face protection
  - **Response**
    - IF ON SKIN: Wash with plenty of soap and water.
    - Take off contaminated clothing and wash before reuse.
    - If skin irritation occurs: Get medical advice/attention.
    - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
    - If eye irritation persists: Get medical advice/attention
  - **Storage/Disposal**
    - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Storage and Handling

- Store the Xpert Xpress GBS cartridges at 2 °C to 28 °C.
- Do not use cartridges that have passed the expiration date on the label.
- Do not use a cartridge that is wet or has leaked.
- Do not open the cartridge lid until you are ready to perform testing.

Specimen Collection, Testing, and Results

Specimen Collection

Specimen Collection, Transport and Storage

1. To obtain an adequate specimen, follow the instructions in this section closely.

   Collect vaginal/rectal swab specimens according to ACOG, European or local recommendations[1, 2, 3] using the Cepheid Collection Device (part number 900-0370).

2. Use gauze to wipe away excessive amounts of secretion or discharge from vaginal rectal area.
3. Remove the Collection Device, a double swab, from the pouch.
4. Carefully insert the double swab into the patient's vagina. Sample secretions from the mucosa of the lower one-third part of the vagina. Rotate the swabs three times to ensure uniform sample on both swabs. Do not collect cervical sample.
5. Using the same double swab, carefully insert the swab approximately 2.5 cm beyond the anal sphincter, and gently rotate to sample anal crypts.

Important **Keep swabs attached to the red cap throughout the procedure.**

6. Remove and discard the clear cap on the transport tube and place swabs into the transport tube, labeled with Sample ID, pushing the red cap down completely.
7. Test specimens as quickly as possible after collection. Specimens can be stored up to 24 hours at 2-25 °C.
   Note Additional stability data available on request.

Procedure

Preparing the Cartridge

Important **Start the test within 30 minutes of adding the sample to the cartridge.**

Note Do not add two swabs to any one cartridge. Only one swab is required. The second swab is extra and can be used for susceptibility or repeat testing. Culture isolates are needed for performing susceptibility testing as recommended for penicillin-allergic patients.

To add the specimen to the cartridge:

1. Wear protective disposable gloves.
2. Remove the cartridge from the package.
3. Inspect the test cartridge for damage. If damaged, do not use it.
4. If cartridge have been stored refrigerated ensure equilibration to room temperature prior to use.
5. Label the cartridge with sample identification.
   Note Write on the side of the cartridge or affix an ID label. Do not put the label on the lid of the cartridge or over the existing 2D barcode on the cartridge.
6. Open the cartridge lid by lifting the front of the cartridge lid.
7. Open the cap of the specimen transport tube.
8. Remove the swabs from the transport tube.
9. Remove one swab from cap and gently brush the two swabs together using a twirling motion for five seconds (see Figure 1).

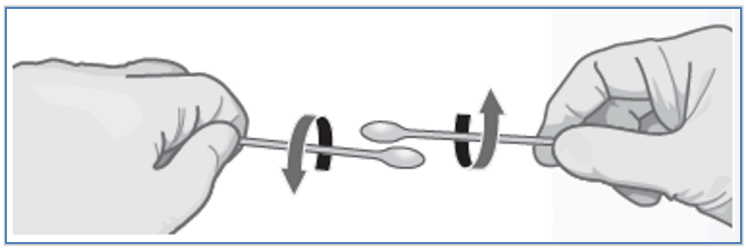


Figure 1 Swab Twirling Motion

10. Return the second swab still attached to the cap back into the transport tube.
11. Using gauze or equivalent, hold the swab to be used for testing above the score mark (see Figure 2).

Figure 2 Xpert Xpress GBS Collection Swab

12. Insert the swab into the Xpert Xpress GBS cartridge sample chamber (see Figure 3).

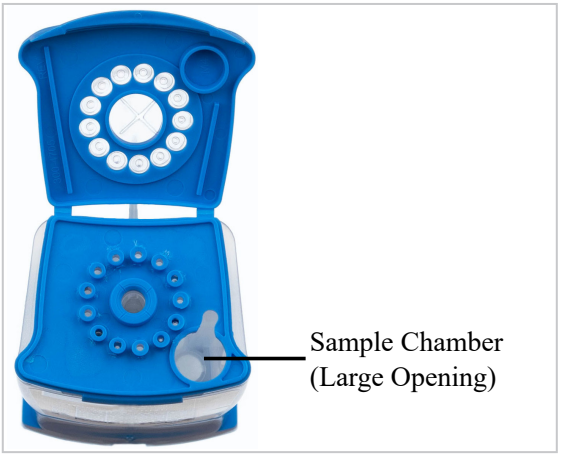


Figure 3 Xpert Xpress GBS Cartridge (Top View)

13. Raise the swab so that the score mark is centered in the notch.
14. Break the swab by snapping the shaft to the right.
15. Ensure the swab is properly positioned in the cartridge and the swab end is not in the notch of the sample chamber opening and does not prevent lid closure. If the swab is stuck in the notch, use a lint free wipe/gauze or the remaining end of the swab to release it from the notch to minimize the risk of contamination.
16. Close the cartridge lid. Start the test within 30 minutes.

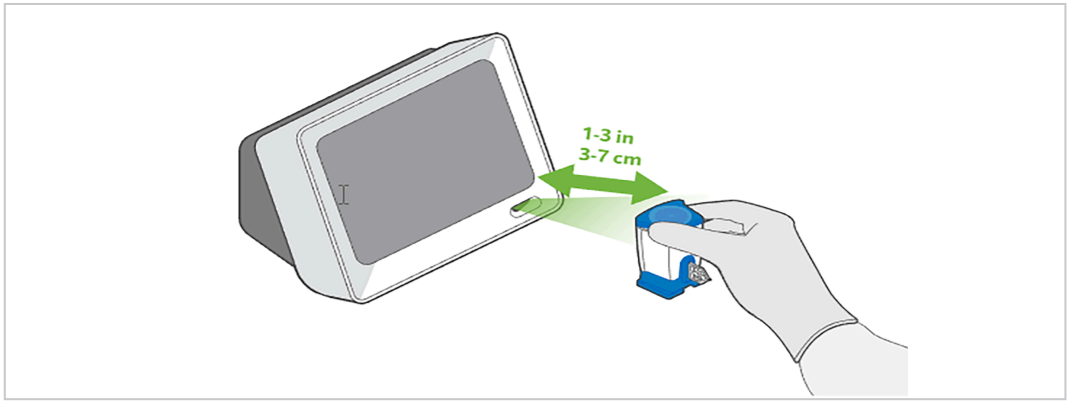
Starting the Test: GeneXpert System with Touchscreen

Important **Before you start the test, make sure that:**

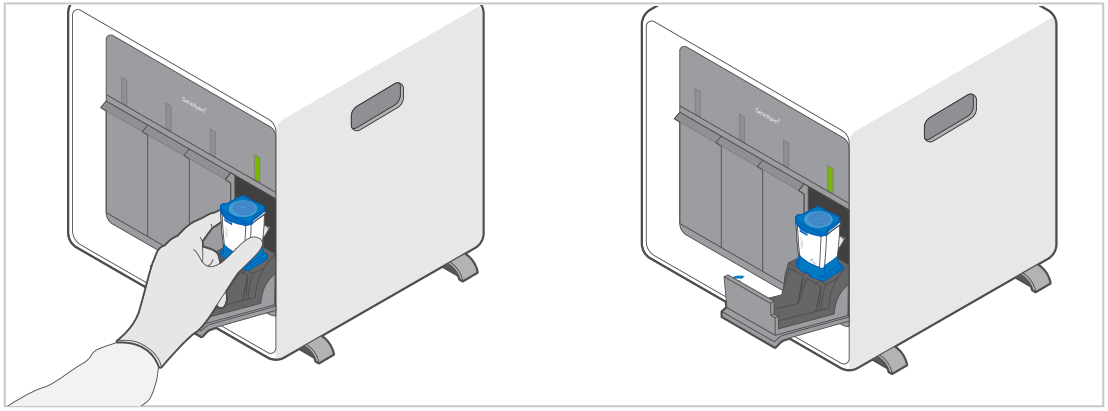
- **The system is running the correct Cepheid OS software version shown in section - Materials Required but Not Provided.**
- **The correct assay definition file is imported into the software.**

Note The default workflow is shown. Your system administrator may alter the workflow.

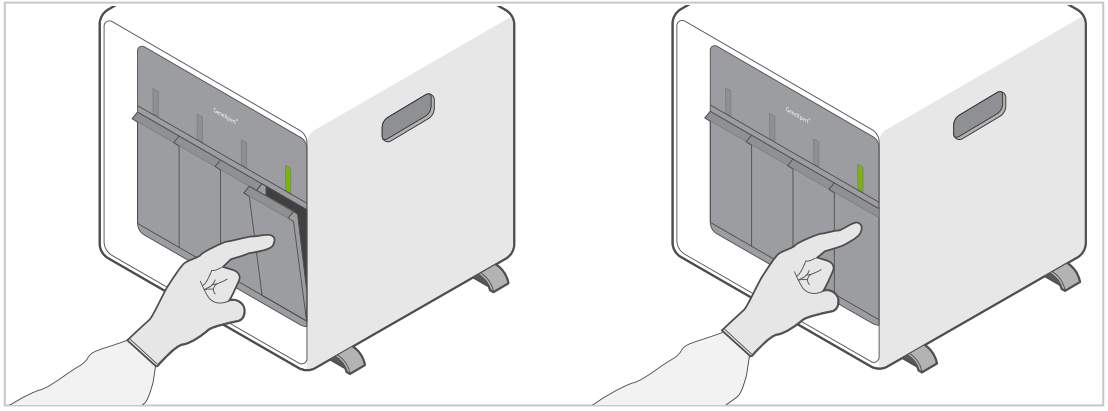
1. Turn on GeneXpert system with touchscreen.
2. Log on to system software using your username and password.
3. On the Modules tab, touch **Start Test**.
4. Follow onscreen prompts to create new test and enter patient and sample information.
5. Scan or manually input the cartridge serial number. If scanning, hold the cartridge about 1-3 inches (3-7 cm) away from the scanner. The scanner projects a green crosshair, which you center on the barcode. Scanning is complete when you hear an audible beep. Touch **Continue**.



6. Select the desired test and touch **Continue**.
7. Watch the cartridge preparation video, if needed.
8. On the Confirm screen, review all data and touch **Confirm**.
9. Open the module door under flashing green light and insert the cartridge.



10. Close cartridge module door completely by pressing until it latches. The test starts.



11. When the test completes, the **Results Summary** screen appears. Open the module door and remove cartridge.
12. Dispose of used cartridge in appropriate waste container according to your institution's standard practices.

Viewing Results: GeneXpert System with Touchscreen

The GeneXpert System with Touchscreen results screen will automatically interpret test results for you and clearly show them in the **View Results** window.

1. Tap **Results**.
2. Tap the test to be viewed in the Results screen.
3. Click **OK**.
4. To generate a PDF report file, touch **View Report**. More detailed instructions for viewing and uploading results are available in your system operator manual.

Quality Control

Internal Controls

Each test includes a Sample Processing Control (SPC), Sample Adequacy Control (SAC) and a Probe check control (PPC).

- **Sample Adequacy Control (SAC)**: Detects the presence of a single copy human gene present in one copy per cell and monitors whether the sample contains human DNA. The SAC controls for adequate sample collection and sample stability to minimize risk of false negative. The SAC should PASS (*that is*, generate a valid cycle threshold (Ct) in a negative sample) and may not amplify in a high positive sample. The SAC passes if it meets the assigned acceptance criteria and is required for a GBS PRESUMPTIVE NEGATIVE result.
- **Sample Processing Control (SPC)**: Ensures the sample was processed correctly. The SPC verifies that sample processing is adequate. Additionally, this control detects sample-associated inhibition of the real-time PCR assay, ensures the PCR reaction conditions (temperature and time) are appropriate for the amplification reaction, and that the PCR reagents are functional. The SPC should PASS (*that is*, generate a valid cycle threshold (Ct) in a negative sample) and may not amplify in a high positive sample. The SPC passes if it meets the assigned acceptance criteria.
- **Probe Check Control (PCC)**: Before the start of the PCR reaction, the GeneXpert Instrument System measures the fluorescence signal from the probes to monitor bead rehydration, reaction-tube filling, probe integrity and dye stability. Probe Check passes if it meets the assigned acceptance criteria.

External Controls

External controls should be used in accordance with local, state, and federal accrediting organizations as applicable.

Results

The results are interpreted automatically by the GeneXpert Instrument Systems from measured fluorescent signals and embedded calculation algorithms and will be shown in the **View Results** window.

Table 1. GBS Results and Interpretation

Result	Interpretation
GBS — POSITIVE[a] [b]	GBS target DNA is detected – Patient likely colonized with GBS. • GBS —POSITIVE • SPC – NA (not applicable). The SPC is ignored because GBS target amplification can compete with this control • Probe Check Controls - PASS • SAC — NA (not applicable)
GBS — PRESUMPTIVE NEGATIVE	GBS target DNA cannot be detected - Patient may/may not be colonized with GBS. • GBS — PRESUMPTIVE NEGATIVE • SPC — PASS • Probe Check Controls—PASS • SAC - PASS
INVALID	Presence or absence of the GBS target DNA cannot be determined. SAC and/or SPC failed and does not meet acceptance criteria. Repeat test according to Retest Procedure. • GBS — INVALID • SPC — FAIL • Probe Check Controls—PASS • SAC — FAIL
ERROR	Presence or absence of GBS target DNA cannot be determined. A system component failed, the maximum pressure was reached, or the probe check failed. Repeat test according to Retest Procedure. • GBS — NO RESULT • SPC — NO RESULT • Probe Check Controls—FAIL[c] • SAC – NO RESULT
NO RESULT	Insufficient data was collected. Presence or absence of GBS target DNA cannot be determined. A **NO RESULT** indicates that insufficient data were collected. For example, the operator stopped a test that was in progress, or a power failure occurred during the test. Repeat test according to Retest Procedure. • GBS — NO RESULT • SPC — NO RESULT • Probe Check Controls—NA (not applicable) • SAC – NO RESULT

a. The Xpert Xpress GBS test includes an Early Assay Termination (EAT) function that will provide earlier time to results in high titer specimens if the signal from the GBS target reaches a predetermined threshold before the full 45 PCR cycles have been completed. When GBS titers are high enough to initiate the EAT function, the SPC and SAC amplification curves may not be seen, and their results may not be reported. EAT can reduce the test time for positive results to approximately ~30 minutes. With **GBS PRESUMPTIVE NEGATIVE** samples, the test returns within ~42 minutes.

b. The following disclaimer will be present on all test reports: "A **GBS PRESUMPTIVE NEGATIVE** should be interpreted as: Patient may or may not be colonized with GBS. Providers must consider all applicable risk factors and clinical guidance regarding a role for intrapartum prophylaxis."

c. If the probe check passed, the error is caused by a system component failure or by exceeding maximum allowable pressure.

Reasons to Repeat Testing

If any of the test results mentioned below occur, repeat the test according to the instructions in .

- An **INVALID** result indicates GBS is not detected and the control SPC and/or SAC failed in one or more of the following causes:

- The specimen was not properly collected or processed.
- The specimen was not added to the cartridge.
- PCR was inhibited.

- An **ERROR** result indicates that the assay was aborted. Possible causes include: the reaction tube was filled improperly; a reagent probe integrity problem was detected; system component failure or the maximum pressure limit was exceeded.
- A **NO RESULT** indicates that insufficient data were collected. For example, the operator stopped a test that was in progress, or a power failure occurred.

Retest Procedure

1. For retest of a **NO RESULT**, **INVALID**, or **ERROR** result, use a new cartridge (do not re-use the cartridge). Use the remaining specimen swab for retesting.
2. Remove the cartridge from the package. Open the cartridge by lifting the cartridge lid.
3. Remove the remaining swab from the collection transport tube.
4. Insert swab into the sample chamber of a new Xpert Xpress GBS cartridge.
5. Raise the swab so that the score mark is centered in the notch.
6. Break the swab by snapping the shaft to the right.
7. Ensure the swab is properly positioned in the cartridge and the swab end is not in the notch of the sample chamber opening and does not prevent lid closure. If the swab is stuck in the notch, use a lint free wipe/gauze or the remaining end of the swab to release it from the notch to minimize the risk of contamination.
8. Close the cartridge lid.
9. Follow the procedure for Starting the Test: GeneXpert System with Touchscreen.

When performing intrapartum testing, repeat testing may not be feasible and will depend on practices and policies within each facility. Coordination between clinicians and the testing laboratory is important to not delay administration of antibiotics while results are pending.

Limitations

Limitations of the Procedure

- A presumptive negative result does not exclude the possibility of GBS colonization. Providers should consider new risk factors, if applicable, and clinical guidance regarding a role for intrapartum prophylaxis. False negative results may occur if the organism is present at levels below the analytical limit of detection.
- For patients with a negative antepartum screening test result, a provider may opt to request this intrapartum test if > 5 weeks have passed from the preceding negative test.
- This test is not intended for use in the antepartum setting.
- This test is intended to be used with specimens collected from pregnant patients during labor who have not received antibiotics within the 14 days of sample collection
- This test should be promptly performed when a patient presents in labor to provide results as quickly as possible, to allow for timely and effective antibiotic prophylaxis, if indicated.
- Test results should not preclude the use of other strategies for providing effective intrapartum prophylaxis when feasible.

- Erroneous test results might occur from improper specimen collection, handling or storage, technical error, or sample mix-up. Careful compliance to the instructions in this insert is important to avoid erroneous results.
- The performance of the Xpert Xpress GBS test was validated using the procedures provided in these Instructions for Use only. Modifications to these procedures may alter the performance of the test.
- The Xpert Xpress GBS test has only been validated with the vaginal/rectal swab specimen using the Cepheid Collection Kit (listed in).
- The Xpert Xpress GBS test does not provide antibiotic susceptibility results. Culture isolates are needed to perform susceptibility testing as recommended for penicillin-allergic patients.
- Test results may be affected by concurrent antibiotic therapy. GBS DNA may continue to be detected following antimicrobial therapy.
- The effect of interfering substances has only been evaluated for those listed within the labeling. Interference by substances other than those described can lead to erroneous results.
- A positive result does not necessarily indicate the presence of viable organisms.
- Mutations in primer or probe binding regions may affect detection of new or unknown variants and may result in a false negative result.
- This test was validated on vaginal/rectal swab specimens collected at intrapartum from antibiotic naïve pregnant patients. The use of this test has not been validated in pregnant patients having received antibiotics within 14 days prior to sample collection.
- Clinical data includes antibiotic naive study participants of 14 years of age or older. The 14–17 age group for antibiotic naïve participants includes two intrapartum vaginal/rectal specimens.

Expected Values

The Xpert Xpress GBS clinical study included vaginal/rectal specimens collected from antibiotic naïve pregnant female participants. The number and percentage of specimens positive for GBS as determined by the Xpert Xpress GBS test are presented in Table 2.

Table 2. Positivity Rates by the Xpert Xpress GBS Test in Participants at Intrapartum

Specimen	Number of Specimens	Number of Positives	Positivity
Intrapartum vaginal/rectal	899	109	12.1%

Specific Performance Characteristics

Clinical Performance

Clinical performance characteristics of the Xpert Xpress GBS test were evaluated in a multi-site, observational, method comparison study using vaginal/rectal swab specimens collected from pregnant patients. The study was conducted at twelve (12) clinical sites from geographically diverse regions within the United States between July 2020 and November 2021.

The clinical performance of the Xpert Xpress GBS test was compared to enriched bacterial culture with species identification via MALDI-TOF MS. Eligible participants provided two sets of dual vaginal/rectal swabs. The first set of swabs was divided – one swab was used for Xpert Xpress GBS testing; the other was used for culture, if the Xpert Xpress GBS test gave a valid result. If the Xpert Xpress GBS test resulted in a non-determinate result, the second set of marked swabs was divided – one swab was used for repeat Xpert Xpress GBS testing; the other was used for culture testing.

Discordant results between the Xpert Xpress GBS test and the comparator method were investigated using an FDA-cleared nucleic acid amplification test (NAAT); the results of which are footnoted in Table 4, for informational purposes only.

Performance of the Xpert Xpress GBS Test vs. Enriched Culture + MALDI-TOF MS

Nine hundred and twelve (912) vaginal/rectal swab specimens were enrolled from eligible participants. Age distribution of vaginal/rectal specimens collected at Intrapartum are represented in Table 3.

Table 3. Age Distribution of Specimens Included

Age Group	Intrapartum Vaginal/Rectal (ABX-) N (%)
14-17	2 (0.2%)
18-24	285 (31.3%)
25-34	507 (55.6%)
≥35	118 (12.9%)
Total	912 (100.0%)

Of the 912, 13 were excluded from the analysis of performance due to non-determinate Xpert Xpress results upon retest or no culture results. A total of 899 intrapartum vaginal/ rectal specimens were included in the performance analyses. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of the Xpert Xpress GBS test as compared to enriched culture with species identification via MALDI-

TOF MS are presented in Table 4. The Xpert Xpress GBS demonstrated a sensitivity of 93.5% and specificity of 95.5% in vaginal/rectal swab specimens collected at intrapartum, and a PPV of 66.1% and NPV of 99.4%, respectively.

Table 4. Xpert Xpress GBS Performance Results vs. Enriched Culture + MALDI-TOF MS –Intrapartum Specimens

Results	Culture Positive	Culture Negative	Total	Sensitivity (95%CI)	Specificity (95%CI)	PPV (95%CI)	NPV (95%CI)
Xpert Xpress GBS Positive	72	37[a]	109	93.5% (85.7–97.2)	95.5% (93.9– 96.7)	66.1% (56.8– 74.3)	99.4% (98.5– 99.7)
Xpert Xpress GBS Presumptive Negative	5[b]	785	790				
Total	77	822	899				

a. Discrepant test results based on an FDA-cleared NAAT: 13/37 GBS positive; 15/37 GBS negative; 9/37 no valid result

b. Discrepant test results based on an FDA-cleared NAAT: 4/5 GBS positive; 1/5 GBS negative

Non-Determinate Rate

Of the 912 Xpert Xpress GBS tests performed in the clinical study, 55 resulted in non-determinate results (**ERROR**, **INVALID** or **NO RESULT**) on the first attempt. Upon retest, 12 specimens remained non-determinate. The initial non-determinate rate was 6.0% (55/912). Upon retest, the final non-determinate rate was 1.3% (12/912).

Analytical Performance

Analytical Sensitivity (LoD) and Analytical Reactivity (Inclusivity)

The analytical limit of detection (LoD) and analytical reactivity (inclusivity) of the Xpert Xpress GBS test were determined for 12 different strains representing 12 known serotypes of GBS, 2 of which were characterized as non-hemolytic Table 5). Serial dilutions of each serotype were prepared in a simulated sample matrix. Serotypes Ia, III and V were tested with 24 replicates per dilution level for each of two reagent lots across three days. Serotypes Ib, Ic, II, IV and VI-X were tested in replicates of 24 for each dilution level using one reagent lot across three days. The estimated LoD values, were verified by testing 20 replicates of each serotype diluted in simulated sample matrix to the upper limit of the 95% confidence interval determined in the probit analysis with one reagent lot across three days. Serotypes Ia, III and V were also verified in clinical matrix. The result for serotypes V and VI was 85% (17/20) detected and the claimed LoD was based on the upper limit of 95% confidence interval. The verified LoD values for the GBS serotypes tested are provided in Table 5.

Matrix Equivalency Studies were performed to support the use of simulated sample matrix for the analytical studies.

Table 5. Xpert Xpress GBS Limit of Detection (LoD)

Serotype	LoD (CFU/mL)	LoD (CFU/Swab)
Ia	663	50
Ib	40	3
Ic[a]	301	23
II[a]	173	13
III	540	41
IV	429	32

Serotype	LoD (CFU/mL)	LoD (CFU/Swab)
V	618[b]	46
VI	544[b]	41
VII	620	47
VIII	682	51
IX	465	35
X	677	51

a. Non-hemolytic strain

b. Claimed LoD corresponds to the upper limit of 95% CI

Analytical Inclusivity with GBS *cfb* Mutants

A study was performed to evaluate the analytical reactivity (inclusivity) of Xpert Xpress GBS for strains containing different deletions ranging from 181 bp to 49 kb in or adjacent to the region of the chromosome that encodes the CAMP factor hemolysis gene *cfb*. Ten (10) unique, well characterized GBS clinical specimens representing different *cfb* mutations were diluted in simulated sample matrix to a concentration of 855 CFU/mL (~ 1x the highest observed LoD) and tested in the Xpert Xpress GBS test. The study was conducted over 3 days testing either 6 or 7 replicates on each day for a total of 20 replicates. All strains with *cfb* mutations were detected with a positivity rate of 100%.

Analytical Specificity (Cross-Reactivity/Exclusivity) and Microbial Interference

The analytical specificity and microbial interference of the Xpert Xpress GBS test was evaluated by testing a panel of 129 non-GBS organisms that can potentially cross-react and interfere with the detection of GBS both in the presence (microbial interference) and absence (cross-reactivity/exclusivity) of GBS. Challenge organisms tested included bacterial, viral, parasite and yeast strains commonly found in vaginal/rectal flora or phylogenetically related to GBS and are shown in Table 6.

Bacteria and yeast were tested at concentrations of ≥ $1x10^6$ CFU/mL, except for *Staphylococcus aureus* which was tested at $2x10^5$ CFU/mL. Viruses and parasites were tested at concentrations of > $1x10^5$ units/mL (tachyzoites, IU or copies/mL). Genomic DNA was tested at > $1x10^6$ copies/mL. The panel of 129 organisms were tested either individually or in pools of 2 - 6 microorganisms in simulated sample matrix, both in presence of GBS at 3x LoD and in absence of GBS. Each pool was tested in replicates of 6. No cross-reactivity or microbial interference of GBS detection was observed with any of the clinically relevant pathogens tested in the study.

Table 6. Analytical Specificity of Xpert Xpress GBS

Organism		
Arcanobacterium (Trueperella) pyogenes	*Haemophilus influenzae*	*Serratia marcescens*
Atopobium (Fannyhessea) vaginae	*Hafnia alvei*	*Shigella flexneri*
Abiotrophia defectiva	Hepatitis B virus	*Shigella sonnei*
Acinetobacter baumannii	Hepatitis C virus	*Staphylococcus aureus*[a]
Acinetobacter lwoffii	Human immunodeficiency virus	*Staphylococcus epidermidis*
Actinobacillus pleuropneumoniae	Human Papillomavirus 18[b]	*Staphylococcus haemolyticus*

Organism		
Aeromonas hydrophila	*Klebsiella (Enterobacter) aerogenes*	*Staphylococcus intermedius*
Alcaligenes faecalis	*Klebsiella oxytoca*	*Staphylococcus lugdunensis*
Anaerococcus lactolyticus	*Klebsiella pneumoniae*	*Staphylococcus saprophyticus*
Anaerococcus prevotii[b]	*Lactobacillus acidophilus*	*Staphylococcus simulans*
Anaerococcus tetradius	*Lactobacillus casei*	*Stenotrophomonas maltophilia*
Bacillus cereus	*Lactobacillus delbrueckii lactis*	*Streptococcus acidominimus*
Bacillus coagulans	*Lactobacillus gasseri*	*Streptococcus anginosus*
Bacteroides fragilis	*Lactobacillus plantarum*	*Streptococcus bovis*
Bifidobacterium adolescentis Reuter	*Lactobacillus reuteri*	*Streptococcus canis*
Bifidobacterium brevis	*Listeria monocytogenes*	*Streptococcus constellatus*
BK virus	*Micrococcus luteus*	*Streptococcus criceti*
Blastocystis hominis[b]	*Mobiluncus curtisii subsp. Curtisii*[b]	*Streptococcus cristatus*
Bordetella pertussis	*Moraxella atlantae*	*Streptococcus downei*
Burkholderia cepacia	*Moraxella catarrhalis*	*Streptococcus dysgalactiae subsp. dysgalactiae*
Campylobacter jejuni	*Morganella morganii*	*Streptococcus dysgalactiae subsp. equisimilis*
Candida albicans	*Mycoplasma genitalium*[b]	*Streptococcus equi subsp. equi*
Candida glabrata	*Neisseria gonorrhoeae*	*Streptococcus gordonii*
Candida tropicalis	Norovirus	*Streptococcus intermedius*
Chlamydia trachomatis	*Pantoea agglomerans*	*Streptococcus mitis*
Citrobacterfreundii	*Pasteurellaaerogenes*	*Serratia liquefaciens*
Clostridiumdifficile	*Peptoniphilus asaccharolyticus*	*Streptococcus mutans*
Cytomegalovirus	*Peptostreptococcus anaerobius*	*Streptococcus oralis*
Corynebacterium accolens	*Porphyromonas asaccharolytica*	*Streptococcus parasanguinis*
Corynebacterium sp. (genitalium)	*Prevotella bivia*	*Streptococcus pneumoniae*
Corynebacterium urealyticum	*Prevotella melaninogenica*	*Streptococcus pseudoporcinus*
Cryptococcus neoformans	*Prevotella oralis*	*Streptococcus pyogenes*[b]
Enterobacter cloacae	*Propionibacterium acnes*	*Streptococcus ratti*
Enterococcus durans	*Proteus mirabilis*	*Streptococcus salivarius*
Enterococcus faecalis	*Proteus vulgaris*	*Streptococcus sanguinis*
Enterococcus faecium	*Providencia stuartii*[b]	*Streptococcus sobrinus*
Enterococcus gallinarum	*Providencia sp.*	*Streptococcus suis*
Epstein-Barr virus	*Pseudomonas aeruginosa*	*Streptococcus uberis*
Escherichia coli	*Pseudomonas fluorescens*	*Streptococcus vestibularis*
Finegoldia magna	*Rhodococcus equi*	*Toxoplasma gondii*
Fusobacterium nucleatum	Rubella virus	*Trichomonas vaginalis*

Organism		
Gardnerella vaginalis	*Salmonella enterica subsp. enterica ser. Dublin (group D)*	*Vibrio cholerae*
Giardia lamblia[b]	*Salmonella enterica subp. typhimurium*	*Yersinia enterocolitica subsp. palearctica*

a. Tested < $1x10^6$ ($2x10^5$ CFU/mL)

b. Evaluated with DNA

Potentially Interfering Substances

Substances that may be present in vaginal/rectal specimens with the potential to interfere with the Xpert Xpress GBS test were evaluated. Potentially interfering endogenous and exogenous substances include human amniotic fluid, meconium, urine, fecal material, human blood, lubricating gel, vaginal anti-itch medications, vaginal antifungal medications, anti- diarrheal medications, laxatives, stool softeners, topical hemorrhoid ointments, body oil, body powder, deodorant sprays, enema solutions, and spermicidal foam. These substances are listed in Table 7.

Potentially interfering substances were tested according to a liquid, solid or tablet workflow. Liquid substances were added directly to the swab. Solid substances were added to the swab by dipping three fourths (3/4) of the swab head into the substance. Tablets were first dissolved in simulated sample matrix and the liquid added directly to the swab.

Negative samples consisting of simulated matrix only were tested in replicates of 6 in the presence of each substance to determine the effect on the performance of the sample processing control (SPC) and Sample Adequacy Control (SAC). Positive samples were prepared using GBS serotype Ia in simulated matrix at 3x LoD and were tested in replicates of 6 per substance. The negative and positive controls were prepared in the absence of potentially interfering substances and consisted of simulated sample matrix only and GBS spiked at 3x LoD into simulated sample matrix, respectively.

For substances that resulted in an **INVALID** test result, the concentration of the substance was reduced by dilution in simulated sample matrix and re-tested. Five exogenous substances (Aquasonic® gel, Floraplus, Pepto Bismol®, Body oil and Xyloproct) showed interference at the concentration initially tested and were subsequently tested at a lower concentration to determine the highest concentration at which no interference was observed. A list of the endogenous and exogenous substances along with their forms and the highest concentrations at which all GBS positive and negative samples were correctly identified by the Xpert Xpress GBS test (that is, no observed interference) is shown in Table 7.

Table 7. Potentially Interfering Substances Tested

Substance	Substance Form	Highest Concentration on Swab Resulting in No Interference
Human Amniotic Fluid	Liquid	60% (v/v)
Human Urine	Liquid	60% (v/v)
Human Whole Blood - EDTA	Liquid	80% (v/v)
Human Whole Blood - Na Citrate	Liquid	80% (v/v)
Leukocytes, Buffy coat, $2x10^7$ WBCs/mL	Liquid	80% (v/v)
Meconium	Solid	100%[a]
Mucus – mucin from porcine stomach	Solid	30% (w/v)
Human Feces - Pool of 10 donors	Solid	100%[a]

Substance	Substance Form	Highest Concentration on Swab Resulting in No Interference
Anti-Diarrheal Medication – Pepto Bismol	Liquid[b]	40% (v/v)
Anti-Diarrheal Medication – Dimor Comp [Dimeticone]	Tablet	0.03% loperamid + 1.7% dimetikon (w/v)
Lubricant – RFSU Klick Ultra Glide	Solid	100%[a]
Lubricant – Sense Me Aqua Glide	Solid	100%[a]
Lubricant – KY-Jelly	Solid	100%[a]
Body Oil – ACO Repairing Skin Oil	Liquid[c]	100%[a]
Dialon Baby – Dialon Baby Powder	Solid	100%[a]
Deodorant Powder – Vagisil® Deodorant Powder	Solid	100%[a]
Deodorant Spray – LN Intimate Deo	Liquid	60% (v/v)
Deodorant Suppositories – Norforms Feminine Deodorant Suppositories	Tablet	46.4% (w/v)
Enema solution – Microlax mikrolavemang	Solid	100%[a]
Oral Laxative – Mylan	Solid	25% (w/v)
Oral Laxative – Phillips Milk of Magnesia	Liquid	60% (v/v)
Oral Laxative – Pursennid Ex-Lax	Tablet	0.64% (w/v)
Spermicidal Foam – Caya preventivgel	Solid	100%[a]
Stool Softener – Laktulos Meda	Liquid	60% (v/v)
Stool Softener – Movicol	Tablet	9% (w/v)
Topical Hemorrhoid Ointment – Xyloproct Rectal Ointment	Solid[d]	8% (v/v)
Topical Hemorrhoid Ointment – Scheriproct rektalsalva / Prednisolone Ointment	Solid	100%[a]
Ultrasound Transmission Gel – Aquasonic Gel	Solid[d]	20% (v/v)
Vaginal Antifungal Gel – Multi-Gyn Actigel	Solid	100%[a]
Vaginal Antifungal Gel – Multi-Gyn Floraplus	Solid[d]	75% (w/v)
Vaginal Anti-itch Cream – Ellen Probiotisk Utvärtes Intim Creme	Solid	100%[a]
Vaginal Antifungal Cream – Canesten	Solid	100%[a]
Vaginal Antifungal Cream – Daktar	Solid	100%[a]

a. 100% represents undiluted solid substances used directly by dipping the upper 3/4 of the swab head into the substance. The amount tested was regarded as well above the typical concentrations found in clinical specimens.

b. Pepto Bismol diluted to 40% in simulated background matrix and no interference observed.

c. Skin oil was tolerated when tested as a solid by dipping 2/3 of the swab head into the substance.

d. Substances were diluted into a simulated background matrix prior to testing: Xyloproct Rectal Ointment was tested at 8%, Aquasonic Gel was tested at 20% and MultiGyn Floraplus was tested at 75%. No interference was detection after dilution.

Carry-over Contamination Study

A study was conducted to assess whether the single-use, self-contained Xpert Xpress GBS cartridge prevents

specimen and amplicon carryover by testing a negative sample immediately after testing a very high positive sample in the same GeneXpert module. The negative sample used in this study consisted of simulated vaginal/rectal matrix and the positive sample consisted of high GBS serotype Ia positive sample spiked at 1.00E+07 CFU/mL (7.50E+05 CFU/swab) into simulated vaginal/rectal matrix. The negative sample was tested in a GeneXpert module at the start of the study. Following the initial testing of the negative sample, the high GBS positive sample was processed in the same GeneXpert module immediately followed by another negative sample. This was repeated 10 times in the same modules, resulting in 10 positives and 11 negatives for the module. The study was repeated using a second GeneXpert module for a total of 20 positive and 22 negative samples. All 20 positive samples were correctly reported as **GBS POSITIVE**. All 22 negative samples were correctly reported as **GBS PRESUMPTIVE NEGATIVE**.

Reproducibility and Precision

The reproducibility and precision of the Xpert Xpress GBS test was evaluated in a multi-center, blinded study using two panels totaling ten members that consisted of simulated vaginal/rectal matrix as negative sample as well as low positive (~1 – 1.5xLoD) and moderate positive (~3x LoD) samples prepared by spiking GBS strain into simulated vaginal/rectal matrix at the respective target levels. Three strains of GBS representing hemolytic phenotypes (serotypes Ia, III, IV) and one strain (Serotype Ic) representing a non-hemolytic phenotype were used in the study. Testing was performed at three sites (one internal, two external) using the GeneXpert Instrument Systems. Each panel member was tested in triplicate each day (one run/day) by two operators on six different days at three different sites (10 members x 2 operators x 3 replicates/day x 6 days x 3 sites). Three lots of the Xpert Xpress GBS cartridges were used, with each lot tested on two days.

The percent agreement of the qualitative results for GBS detection for each panel member analyzed by each of the six operators and by each site is shown in Table 8. In addition, the overall percent agreement for each sample (total agreement) and the 95% two-sided Wilson Score confidence interval are presented in the last column.

Table 8. Summary of Reproducibility and Precision Results – % Agreement

Panel Member	Sample	Level	Site 1			Site 2			Site 3			Total Agreement (95% CI)
			Op 1	Op 2	Site	Op 1	Op 2	Site	Op 1	Op 2	Site	
1	Negative	Negative	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	94.1% (16/17)	100.0% (18/18)	97.1% (34/35)	99.1% (106/107) (94.9% - 100.0%)
2	GBS serotype Ia Low Pos	~1xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (108/108) (96.6% - 100.00%)
3	GBS serotype III Low Pos	~1xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	83.3% (15/18)	100.0% (17/17)	91.4% (32/35)	97.2% (104/107) (92.1% - 99.0%)
4	GBS serotype IV Low Pos	~1xLoD	94.4% (17/18)	88.9% (16/18)	91.7% (33/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	88.9% (16/18)	94.4% (34/36)	95.4% (103/108) (89.6% - 98.0%)
5	GBS serotype Ia Mod Pos	~3xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (108/108) (96.6% - 100.0%)

Panel Member	Sample	Level	Site 1			Site 2			Site 3			Total Agreement (95% CI)
			Op 1	Op 2	Site	Op 1	Op 2	Site	Op 1	Op 2	Site	
6	GBS serotype III Mod Pos	~3xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100% (108/108) (96.6% - 100.0%)
7	GBS serotype IV Mod Pos	~3xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100% (108/108) (96.6% - 100.0%)
8	Negative 2	Negative	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (108/108) (96.6% - 100.0%)
9	GBS Serotype Ic Low Pos	~1.5xLoD	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (108/108) (96.6% - 100.0%)
10	GBS Serotype Ic Mod Pos	~3xLoD	94.4% (17/18)	100.0% (18/18)	97.2% (35/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	100.0% (18/18)	100.0% (18/18)	100.0% (36/36)	99.1% (107/108) (94.9% - 100.0%)

Evaluation of repeatability and the within-laboratory precision of the underlying Ct values obtained in the Xpert Xpress GBS test was analyzed. The mean, standard deviation (SD), and coefficient of variation (CV) between-sites, between-lots, between-days, between-operators and within-assay for each panel member are shown in Table 9.

Table 9. Summary of Reproducibility Data

Panel Member	N[a]	Mean	Site		Op		Lot		Day		Within Assay		Total	
			SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)
Negative[b]	107[c]	32.4	0.1	0.2	0.0	0	0.5	1.5	0.2	0.7	0.8	2.4	1.0	2.9
Low Pos GBS serotype Ia ~1xLoD	108	34.7	0.0	0	0.0	0	0.3	0.9	0.2	0.5	1.2	3.3	1.2	3.5
Low Pos GBS serotype III ~1xLoD	104[d]	34.8	0.0	0	0.0	0	0.4	1.1	0.0	0	1.3	3.8	1.4	3.9
Low Pos GBS serotype IV ~1xLoD	103[e]	35.2	0.2	0.4	0.0	0	0.5	1.4	0.0	0	1.0	2.7	1.1	3.1
Mod Pos GBS serotype Ia ~3xLoD	108	33	0.3	1	0.0	0	0.0	0	0.0	0	1.0	3.1	1.1	3.3
Mod Pos GBS serotype III ~3xLoD	108	33.1	0.0	0	0.0	0	0.3	1	0.3	1	0.8	2.5	1.0	2.9
Mod Pos GBS serotype IV ~3xLoD	108	33.7	0.0	0	0.3	1	0.3	0.9	0.1	0.3	0.8	2.3	0.9	2.7

Panel Member	N[a]	Mean	Site		Op		Lot		Day		Within Assay		Total	
			SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)
Negative 2[b]	108	32.5	0.2	0.5	0.0	0	0.5	1.4	0.2	0.7	0.6	2	0.8	2.6
Low Pos GBS serotype Ic ~1.5xLoD	108	34.7	0.1	0.3	0.0	0	0.2	0.6	0.5	1.3	1.1	3.2	1.2	3.5
Mod Pos GBS serotype Ic ~3xLoD	107[f]	33.8	0.0	0	0.2	0.5	0.1	0.3	0.4	1.2	0.7	2.0	0.8	2.4

a. Results with valid non-zero Ct values of 108

b. SPC Ct values were used to perform ANOVA analysis for Negative samples.

c. One sample gave a non-determinate result

d. Three samples with GBS Ct value = 0 and one non-determinate sample were excluded from ANOVA analysis

e. Five samples with GBS Ct value = 0 were excluded from ANOVA analysis

f. One sample with a GBS Ct value = 0 was excluded from ANOVA analysis

Appendix

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Table of Symbols

Symbol	Meaning
REF	Catalog number
IVD	*In vitro* diagnostic medical device
	Do not reuse

Symbol	Meaning
	Batch code
	Consult instructions for use
	Manufacturer
	Country of manufacture
	Contains sufficient for *n* tests
	Expiration date
	Temperature limitation
	Biological risks
	Caution
	Warning
	For prescription use only

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Revision History

Description of Changes: 303-1853 Rev. A to B

Section	Description of Change
Principle of the Procedure	Corrected error.
Specimens	Corrected error.
Results	Corrected error.
Potentially Interfering Substances	Corrected footnote labeling.