Technical Training
Xpert® Xpress GBS

Catalog Number (XPRSGBS-CE-10)
For CE-IVD Only

CE IVD In Vitro Diagnostic Medical Device

302-9310 Rev. A November 2022

Training Agenda

1. Reagents
2. Sample collection
3. Kit storage and handling
4. Preparing the cartridge
5. Quality controls
6. Results analysis
7. Discussion

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Training Objectives

At the end of the training, users will be able to:

- Properly store and handle the Xpert® Xpress GBS cartridge kit and sample collection
- Follow proper laboratory safety precautions
- Collect and transport appropriate specimen
- Prepare a cartridge and run the Xpert® Xpress GBS test
- Report the various software generated results
- Understand the Xpert® Xpress GBS control strategy

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The Cepheid Solution

- Simultaneous detection of unique sequences in two GBS chromosomal targets
- On-board internal controls for each sample
  - Sample Processing Control (SPC)
  - Sample Adequacy Control (SAC)
  - Probe Check Control (PCC)
- Results in 42 minutes minutes with Early Assay Termination (30 minutes) for positive results
- Closed cartridge system minimizes risk of contamination
- On-demand results
- Random access

al Device. May not be available in all countries. Not available in the United States.

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Intended Use

- The Xpert® Xpress GBS test, performed on the GeneXpert® Instrument Systems is an automated qualitative *in vitro* diagnostic test for the detection of DNA from Group B *Streptococcus* (GBS) using real-time polymerase chain reaction (PCR). The test is performed using a dual vaginal/rectal swab specimen collected from pregnant females during antepartum or intrapartum.
- The Xpert® Xpress GBS test is intended to aid in the diagnosis of GBS colonization to identify 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 females.

Intended User/Environment

- The Xpert® Xpress GBS is intended to be performed by trained users in both laboratory and near patient testing settings.

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Targets

1) Two GBS chromosomal targets :

- one target is within a coding region for a glycosyl transferase family protein
- the other target is within a coding region for a *LysR* family transcriptional regulator of *S. agalactiae* DNA.

2) Sample processing control (SPC)

3) Sample Adequacy Control (SAC)

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Xpert® Xpress GBS Requirements

GeneXpert® Systems

- GeneXpert Dx software **v5.3** or higher
- Xpertise software **v6.8** or higher

Test Kits

- Catalog Number (XPRSGBS-CE-10)

Sample Collection

- vaginal/rectal swab specimen

Materials Required but Not Provided

- Cepheid Collection Device (part number 900-0370)

Other Materials

- Personal Protective Equipment (PPE)
- 1:10 dilution bleach
- 70% ethanol or denatured ethanol

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Good Laboratory Practice Review

Personal Protective Equipment (PPE)	• Wear clean lab coats, safety glasses, and gloves • Change gloves between processing samples
Lab Bench Area	• Clean work surfaces routinely with: ✓ 1:10 dilution of household bleach* ✓ 70% Ethanol Solution • After cleaning, ensure work surfaces are dry
Specimens, Samples, and Kits Storage	• Store specimens and samples away from kit to prevent contamination
Equipment	• Use filtered pipette tips when recommended • Follow the manufacturer's requirements for calibration and maintenance of equipment

* Final active chlorine concentration should be 0.5% regardless of the household bleach concentration in your country.

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Kit Handling

Xpert® Xpress GBS Kit Contents

Catalog Number	**Catalog Number**(XPRSGBS-CE-10)
Cartridges* Per Kit	10
Kit CD	Xpert® Xpress GBS Assay Definition File (ADF)
	Xpert® Xpress GBS Import Instructions
	Package Insert (PDF)
Storage	2-28 °C

* *Cartridges contain chemically hazardous substances - please see Package Insert and Safety Data Sheet for more detailed information.*

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Warnings and Precautions

- Do not open a cartridge lid until you are ready to perform testing.
- Do not use a cartridge that:
  - appears wet, has leaked or if the lid seal appears to have been broken
  - appears damaged
  - has been dropped after removing it from packaging
  - has been dropped or shaken after adding the sample to it. Shaking or dropping the cartridge after opening the lid may yield an erroneous result
  - has a damaged reaction tube
  - has been used; each cartridge is single-use to process one test
  - has expired
- Do not place the sample ID label on the cartridge lid or on the bar code label.
- Do not reuse cartridges

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Warnings and Precautions (continued)

- Do not use a visibly damaged cartridge.
- Do not place the sample ID label on the cartridge lid or on the bar code label.
- For *in vitro* diagnostic use.
- 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.

6. Centers for Disease Control and Prevention. Biosafety in microbiological and biomedical laboratories, 5th Edition, HHS Publication no. (CDC) 21-1112, Dec. 2009
7. Clinical and Laboratory Standards Institute. Protection of laboratory workers from occupationally acquired infections, Approved Guideline. Document M29-A4, Fourth Edition, May 2014.

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Warnings and Precautions (continued)

- 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.
- 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.

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Warnings and Precautions (continued)

- 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.

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Warnings and Precautions (continued)

- 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® Dx System Operator Manual* or *GeneXpert® Infinity System Operator Manual* are necessary to avoid erroneous results.

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Xpert® Xpress GBS Limitations

- 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.
- A negative result does not rule out the possibility of GBS colonization. False negative results may occur if the organism is present at levels below the analytical limit of detection.

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Xpert® Xpress GBS Limitations (continued)

- The Xpert® Xpress GBS test does not provide antibiotic susceptibility results. Culture isolates are needed to perform susceptibility testing as recommended for penicillin-allergic females.
- 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 labelling. 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.

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Xpert® Xpress GBS Limitations (continued)

- This test was validated on vaginal/rectal swab specimens collected at antepartum or intrapartum from antibiotic naïve pregnant females. The use of this test has not been validated in pregnant females 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 and zero antepartum vaginal/rectal specimens

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Specimen Collection, Storage and Transport

Specimen Transport and Storage

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

Specimen Type	Testing	Storage	Transport	Stability
Vaginal/rectal swab	Immediately OR done after 24 hours	2-8ºC (if not being processing/ processed after 24Hrs) OR 25ºC(processed within 24Hrs) OR	2-8ºC	Up to 6 days at 2-8ºC

1. Di Renzo GC, Melin P, Berardi A, et al. Intrapartum GBS screening and antibiotic prophylaxis: a European consensus conference. J Matern Fetal Neonatal Med. 2015 May;28(7):766-82.
2. Prevention of Group B Streptococcal Early-Onset Disease in Newborns: ACOG Committee Opinion, Number 782. Obstet Gynecol. 2019 Jul;134(1):1.doi: 10.1097/AOG.0000000000003334.
3. Filkins, L, Hauser, J, Robinson-Dunn, B et al. Guidelines for the Detection and Identification of Group B *Streptococcus.* American Society for Microbiology, March 2020. https://asm.org/Guideline/Guidelines-for-the-Detection-and- Identification-of accessed Dec 1, 2021.

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Cartridge Preparation

Proper Cartridge Handling Techniques

Correct

- Do not touch the reaction tube
- Keep the cartridge upright
- Do not tilt after sample is added

Incorrect

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Xpert® Xpress GBS Cartridge Preparation

Xpert® Xpress GBS Cartridge Preparation

Refer to the package insert for detailed instructions, precautions, and warnings.

For a copy of the SDS, visit
www.cepheid.com or
www.cepheidinternational.com

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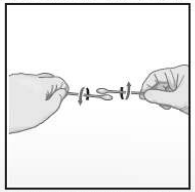
A better way.

1 Obtain one cartridge.

2 Open the cartridge lid.

3 Remove one swab from cap and gently brush the two swabs together using a twirling motion for five seconds. Return the second swab still attached to the cap back into the transport tube.



Note: *Do not hold the swab below the score mark*

4 Insert the swab into the cartridge sample chamber. Break the swab at the score mark.

Note: *Use gauze or its equivalent to minimize the risk of contamination.*

5 Make sure the swab can float freely in the chamber.

Incorrect swab placement. Swab end is caught in the notch of the sample chamber opening.

6 Close the cartridge lid. Start the test within the timeframe specified in the package insert.

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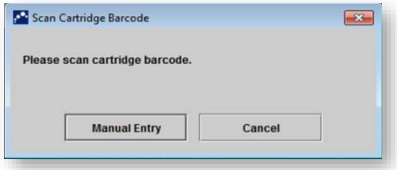
Run a Test on GeneXpert® Dx

1 Create a test.

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

2 Scan barcode for Patient and/or Sample ID.



Do not click on Manual Entry or Cancel.

3 Scan the cartridge.

For complete details on how to run a test, refer to the Package Insert and the GeneXpert Dx Operator Manual.

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Run a Test on GeneXpert® Dx (continued)

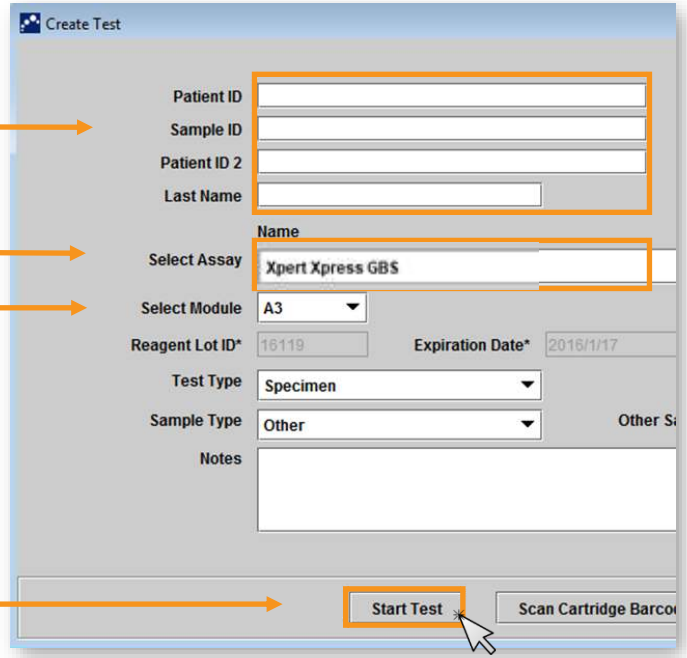
4 Complete the fields as required.

5 Xpert® Xpress GBS test is selected automatically.

6 The module is selected automatically.

7 Click on Start Test.

8 A green light will flash on the module.
Load the cartridge into module and close the door.



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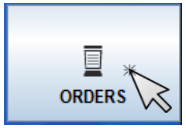
Run a Test on GeneXpert® Infinity

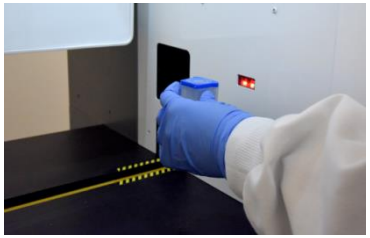
1 Create a test.



Place the cartridge on the conveyor within **30 minutes** of adding the sample.

2 Scan barcode for Patient and/or Sample ID.

3 Scan the cartridge.



For complete details on how to run a test, refer to the Package Insert and the Xpertise Operator Manual.

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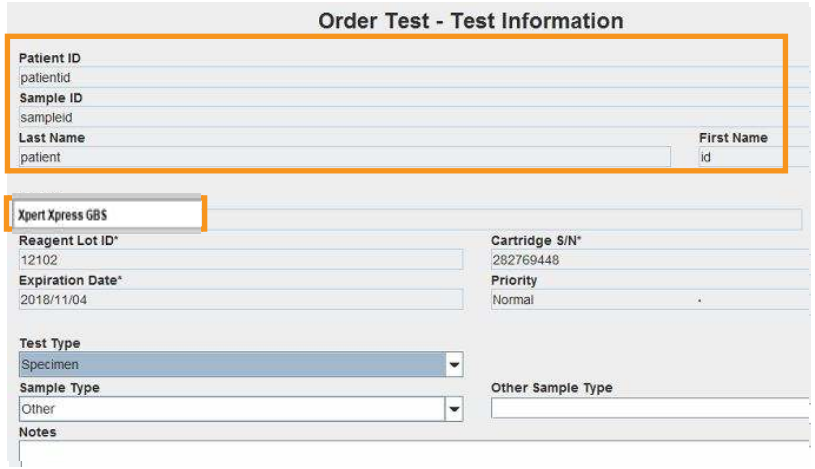
Run a Test on GeneXpert® Infinity (continued)

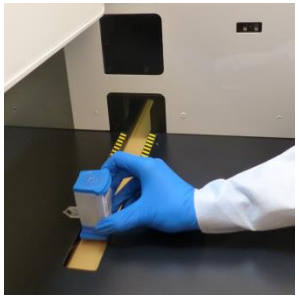
4 Complete the fields as required.

5 Xpert® Xpress GBS test is selected automatically.

6 Click SUBMIT.



7 Place the cartridge onto the conveyor belt.



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Automated Xpert® Xpress GBS Protocol

1. Sample is added to the cartridge
2. The cartridge is loaded into the System
3. Nucleic acids are purified
4. Purified nucleic acids mix with the PCR reagents
5. Simultaneous amplification and detection occurs
6. Results are ready to view

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Quality Controls

Xpert® Xpress GBS Control Strategy

CONTROL

- Xpert® Xpress GBS Quality Controls
  - Each Xpert® cartridge is a self-contained test device
  - Cepheid designed specific molecular methods to include internal controls that enable the system to detect specific failure modes within each cartridge:
    - Sample Processing Control (SPC)
    - Sample Adequacy Control (SAC)
    - Probe Check Control (PCC)

Refer to 301-4868 GeneXpert® Quality Control Features for all Cepheid Xpert tests.

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Internal Quality Controls

Sample Processing Control (SPC)

- Ensures the sample was correctly processed. The SPC is *B. globigii* in the form of a dry bead and is included in each cartridge. The SPC monitors accurate sample processing conditions, sample inhibition, lysis and elution processing. The SPC should pass — 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. if not an invalid result would be reported.

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. If not, an error result would be reported.

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Internal Quality Controls continued

Sample Adequacy Control (SAC)

- Ensures that the sample contains human cells or human DNA.
- This multiplex assay includes primers and probes for the detection of a single copy human gene.
- The SAC signal is only to be considered in an analyte negative sample since it serves as a control for adequate sample collection and sample stability to minimize risk of for false negative call out.
- A negative SAC indicates that no human cells are present in the sample due to incorrect sample collection or insufficient amount of sample on the swab.
  - The SAC should pass —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 valid GBS Negative result, if not an invalid result would be reported.

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Commercially Available External Controls

- External controls may be used in accordance with local, state, and federal accrediting organizations, as applicable.
- Below are the details of External controls for this product :
  - Customers can obtain GBS control material to aid in the implementation process by ordering the following controls from Microbiologics .
- Swab-based Helix Elite rapid Group B Streptococcus (GBS) control panel:
  - PN: 8242 (6 inactivated Pos and 6 inactivated Neg swabs)
  - PN: 8258 (10 inactivated Pos and 10 inactivated Neg swabs)

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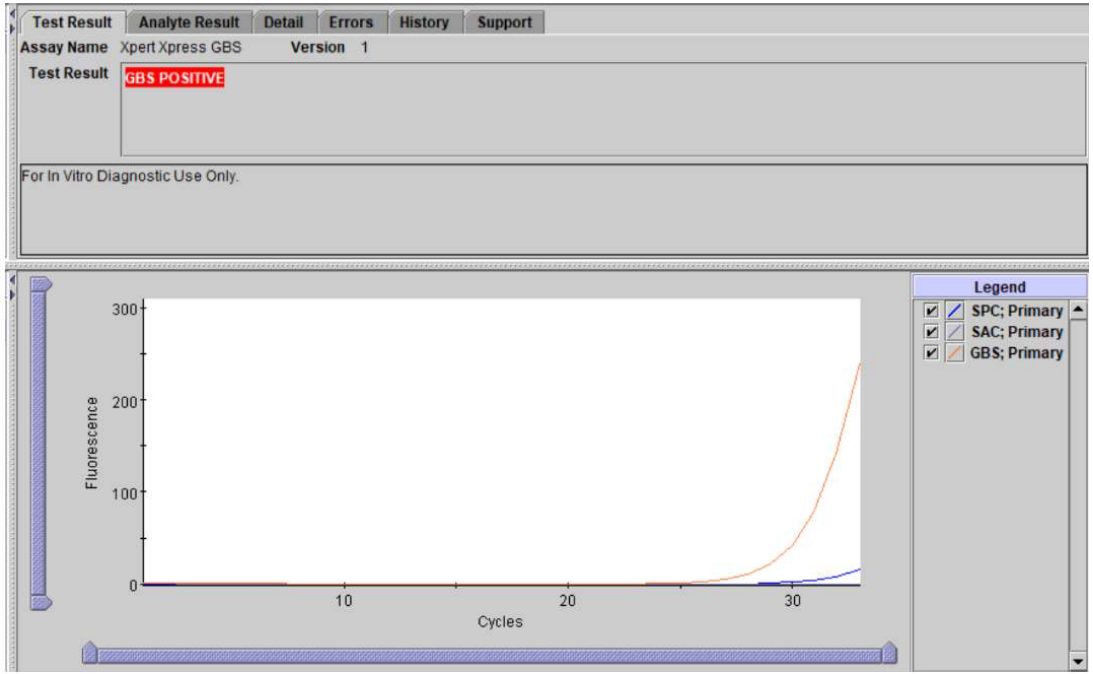
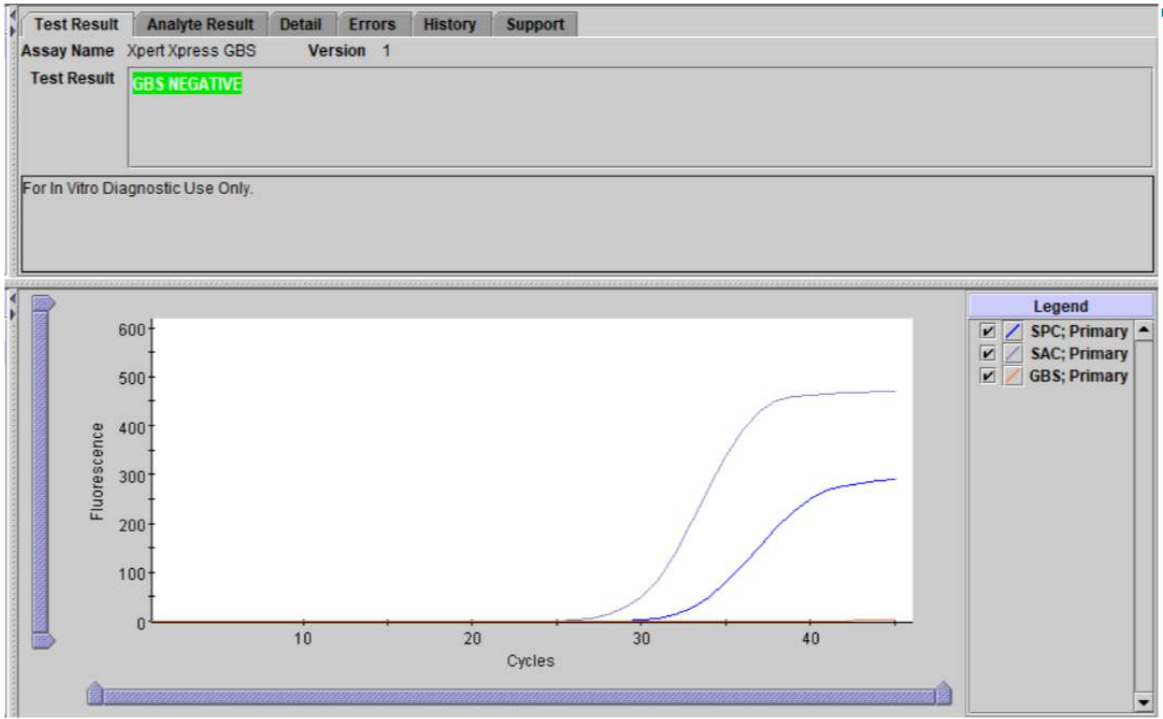
Result Interpretation

GBS POSITIVE



- GBS target DNA is detected – presumed for GBS colonization.
  - GBS – POSITIVE
  - SPC – NA (The SPC is ignored because GBS target amplification can compete with this control
  - PCC – PASS
  - SAC – NA (not applicable)

GBS NEGATIVE



- GBS target DNA not detected
  - GBS – NEGATIVE
  - SPC – PASS
  - PCC – PASS
  - SAC – PASS

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Troubleshooting

Factors That Negatively Affect Results

- Improper specimen collection.
  - The performance of this assay with other specimen types or samples has not been evaluated.
- Inadequate numbers of organisms are present in the specimen.
- Improper transport or storage of collected specimen.
  - Storage and transport conditions are specimen specific.
  - Refer to the Instructions For Use for the appropriate handling instructions.
- Improper testing procedure.
  - Modification to the testing procedures may alter the performance of the test.
  - Careful compliance with the Instructions For Use is necessary to avoid erroneous results.

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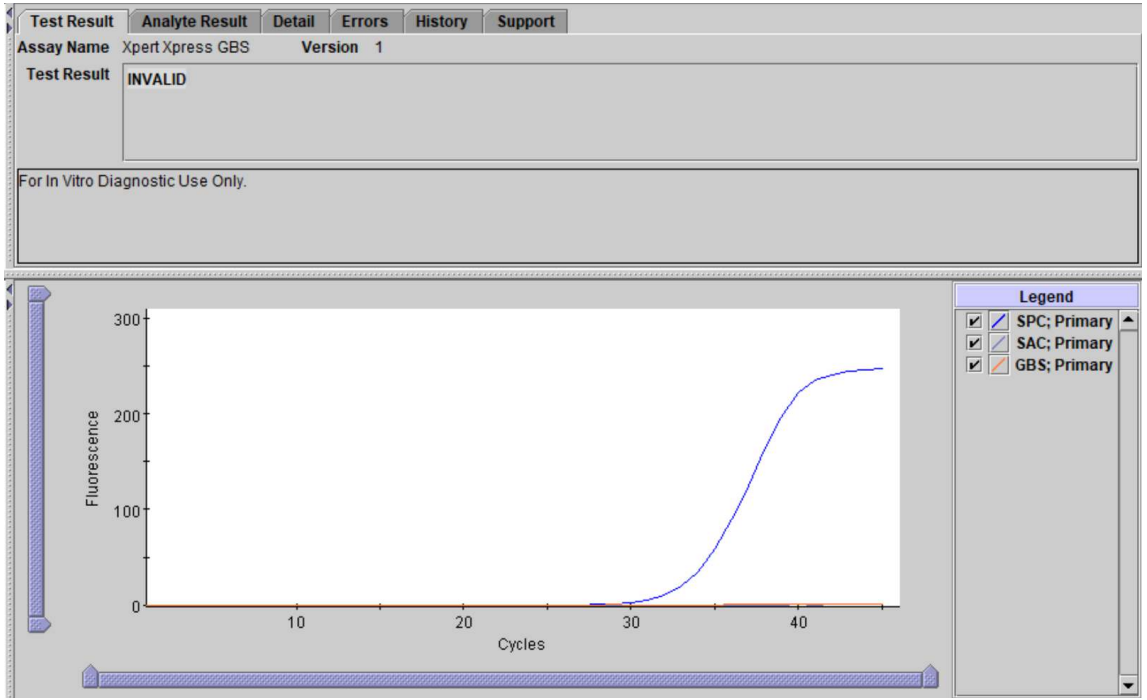
INVALID Result



- Presence or absence of the GBS target DNA cannot be determined.
- SAC and/or SPC does not meet acceptance criteria.
  - GBS – INVALID
  - SPC – FAIL
  - PCC – PASS
  - SAC – FAIL

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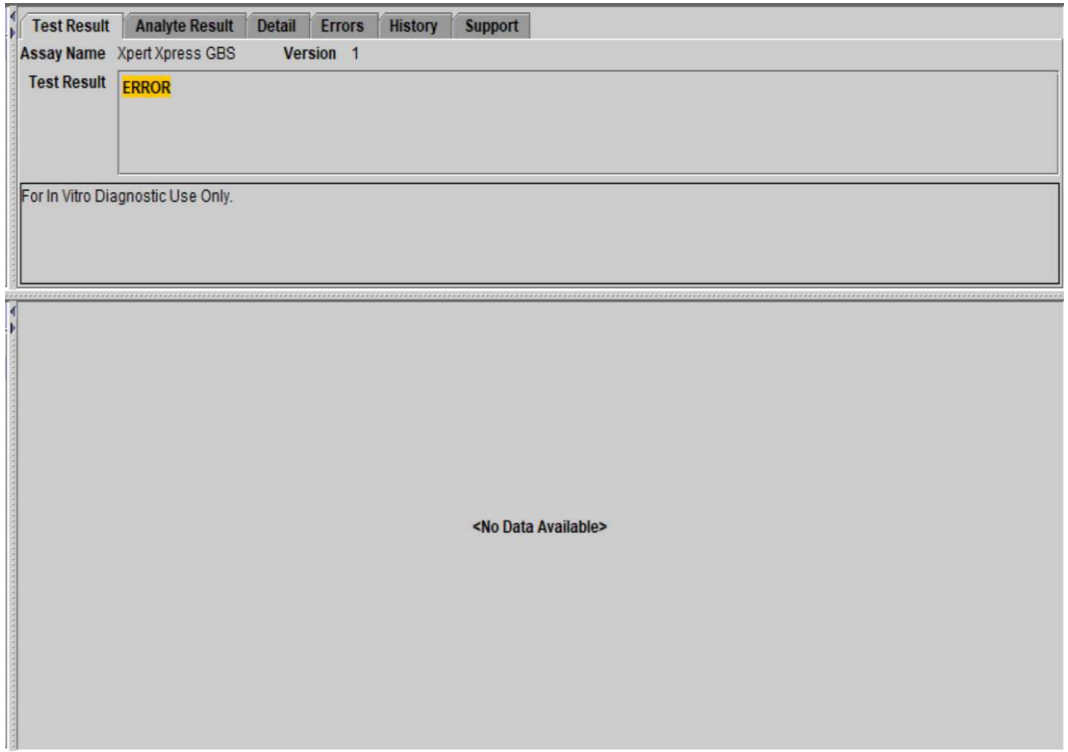
ERROR Result



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.
  - GBS – NO RESULT
  - SPC – NO RESULT
  - PCC – N/A (not applicable)
  - SAC – NO RESULT

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NO RESULT

- Insufficient data was collected. Presence or absence of GBS target DNA cannot be determined.
- The operator stopped a test or a power failure occurred during the test.
  - GBS – NO RESULT
  - SPC – NO RESULT
  - PCC – N/A (not applicable)
  - SAC – NO RESULT

Retesting

- If any of the test results mentioned below occur, repeat the test

- 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.

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Retest Procedure

Xpert Retest Procedure

• Xpert® Xpress GBS

Refer to the package insert for detailed instructions, precautions, and warnings.

For a copy of the SDS, visit
www.cepheid.com or
www.cepheidinternational.com

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A better way.

1 Discard used cartridge. Obtain a new Xpert® Xpress GBS cartridge. Remove the remaining swab from the collection transport tube.

2 Insert swab into the sample chamber of the new cartridge. Raise the swab so that the score mark is centered in the notch. Break the swab by snapping to the right.

3 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.

4 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.

5 Close the cartridge lid. Start the test within the timeframe specified in the package insert.

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Technical Assistance

- Before contacting Cepheid Technical Support, collect the following information:
  - Product name
  - Lot number
  - Serial number of the System
  - Error messages (if any)
  - Software version

- Log your complaint online using the following link ***http://www.cepheid.com/en/support*****:** *Create a Support Case*

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Thank You

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