



Catalase

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Kettering Health Network (KHN) Organization-Wide Policy

KHN adopts this policy for Kettering Medical Center, Sycamore Medical Center, Grandview Hospital and Medical Center/Southview Hospital, Greene Memorial Hospital, Inc., Soin Medical Center, Fort Hamilton Hospital, Troy Hospital, Kettering Physician Network, all hospital off-sites, and KHN Support Services.

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I. PRINCIPLE

The enzyme catalase is present in most cytochrome containing aerobic and facultative anaerobic bacteria. It decomposes hydrogen peroxide to form free oxygen and water. The test is most widely applied to differentiate between genera, primarily between the staphylococci and streptococci.

II. SPECIMEN COLLECTION, TRANSPORT, AND HANDLING

A. Specimens

1. Isolated colonies growing on solid media.

III. MATERIALS

A. Reagents

1. 3% Hydrogen Peroxide
 - a. Store in amber bottle at room temperature (15-30°C).
 - b. Good until manufacturer's expiration date.

B. Other Supplies

1. Glass Slides
2. Disposable Bacteriological Loops
3. Applicators
4. Pipette

IV. QUALITY CONTROL

- A. Controls are performed on each new lot and each new shipment.
- B. Patient results are invalid if control organisms do not perform as expected.

Organism	Expected Result
Staphylococcus aureus ATCC 29213	Positive
Enterococcus faecalis ATCC 29212	Negative

V. PROCEDURE

- A. With a loop or an applicator, remove a suspected colony from the culture plate, and smear the bacteria on the slide.
- B. Without touching the slide, drop 1 – 2 drops of 3% Hydrogen Peroxide onto the bacterial smear.
Do not mix.
- C. Observe for production of bubbles.
- D. Record results in LIS and discard slide into a biohazard sharps container.

VI. INTERPRETATION

- A. Positive result
 1. Bubbles produced.
- B. Negative result
 1. No bubbles produced.

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VII. REPORTING RESULTS

A. Resulting in Epic Beaker

1. Select result entry and scan specimen number.
 - a. Verify patient information matches patient information on the culture before proceeding
2. Click on "Edit"
3. Select the "Workup" tab
4. Add a "Component"

The screenshot shows the 'Add Component' dialog box. It has a title bar 'Add Component' and a subtitle 'To add components on all isolates or plates in workup, select the 'All isolates in workup' or 'All plates in workup' option when specifying isolates or plates.' Below this is a table with columns: Workcard, Component, Isolate, Plate. Row 1: 1, CATALASE, ISO1, (6) BAP. Row 2: 2, (empty), (empty), (empty). At the bottom are buttons: Add Isolate, Accept, Cancel. A red arrow points to the 'Component' field.

5. Type "catalase" into the component box, and then choose the appropriate isolate and plate information
6. Enter the result of positive or negative in the value box for the Catalase Test
 - a. Make sure you are resulting under the proper date of testing

The screenshot shows the Epic Beaker interface with the 'Workup' tab selected. A table displays test results. A red arrow points to the 'Coagulase negati' result for the CATALASE component.

Status	Isolate	Plate	Component	Use Type	Latest Value	Organism
1	ISO1	(6) BAP	ORGANISM		Coagulase negative: Staphylococ	(#1) 07/09/19
2		(6) BAP	CATALASE	Use	Positive	Positive
3		(6) BAP	STAPH LATEX	Use	Negative	Negative
4	Plates: 3 confirmed					

7. Prelim or final verify results as appropriate.

VIII. CRITICAL DETERMINANTS

- A. Delayed or very weak reactions may be due to the transfer of small fragments of erythrocytes from the medium.
- B. Vigorous mixing of the colony in the hydrogen peroxide may cause bubbles as a result of mixing rather than the true evolution of gas.
- C. Better results are obtained from colonies 18 - 24 hours old.
- D. Unusual results should be brought to the attention of the Microbiology Supervisor and/or Medical Director.

IX. REFERENCES

- A. Jorgensen, J. H., Pfaller, M. A., Carroll, K. C., Landry, M. L., Funke, G., Richter, S. S., et al. (2015). *Manual of Clinical Microbiology 11th Edition American Society for Microbiology*. Washington: ASM Press.
- B. Weber, A. L. (2016). *Clinical Microbiology Procedures Handbook 4th Edition American Society for Microbiology*. Washington: ASM Press.

X. FORMS ASSOCIATED WITH PROCEDURE

- A. MB.30.025.FA Catalase Quality Control Form

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