



# Clinical Laboratory Department POLICY AND PROCEDURE

POLICY NUMBER: 1224

VERSION: 4

## **SUBJECT: BACTiStaph-rapid latex agglutination test for Staphylococcus aureus**

### Principle:

*Staphylococcus aureus* and other coagulase positive staphylococcus have been identified as a cause of suppurative infections, food poisoning, toxic shock syndrome, and have been isolated from nearly all anatomical sites. The coagulase tube test which detects extracellular staphylocoagulase, sometimes called free coagulase, has long been the standard procedure routinely used for the identification of staphylococcus. Rapid slide agglutination procedures have shown the same reliability as the tube coagulase method. Staphaurex is a rapid test utilizing fibrinogen and IgG-coated latex particles that are capable of detecting both cell-associated clumping factor and Protein A. This distinguishes *Staphylococcus aureus* from other species of staphylococcus.

### Reagents and Materials:

- Test Latex Reagent: Contains a buffered suspension of polystyrene latex particles coated with human fibrinogen and IgG. Also contains 0.025% Bronidox preservative.
- Disposable reaction cards
- Disposable Mixing sticks

### Precautions:

Precautions should be taken against microbial hazards.

This kit contains components of human origin and therefore should be considered as potentially infectious. It is recommended that these reagents and test specimens be handled using established good laboratory working practices.

- Do not use the reagents beyond the stated expiry date.
- Latex reagents should be brought to room temperature (15-30°C) before use.
- It is important when using dropper bottles that they are held vertically and that the drop forms at the tip of the nozzle. If the nozzle becomes wet, an incorrect volume will form around the end and not at the tip; if this occurs dry the nozzle before proceeding.
- Latex reagents showing signs of aggregation before use should not be



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used.

- Do not touch the reaction areas on the cards.
- Do not interpret agglutination that appears after 20 seconds as a positive result. Prolonged rocking can result in false-positive reactions with some coagulase-negative isolates.
- Microbiological contamination of reagents must be avoided as this may reduce the life of the product and cause erroneous results.

### Storage:

Store all reagents in an upright position at 2-8°C where it will retain activity at least until the date shown on the bottle label. Do not freeze. Avoid storage at room temperature (15-30°C). Do not stand the reagent in bright light on the bench. Reaction cards and mixing sticks should be stored at room temperature (15-30°C).

### Procedure:

1. Screen suspect staphylococcus colonies using a Gram stain before proceeding to the latex test procedure.
2. Bring reagents to room temperature before use.
3. Just prior to use, shake the latex to obtain an even suspension.
4. Dispense a drop of the latex suspension on the reaction card for each culture to be tested.
5. Cultures may be tested direct from the primary plate, or a subculture can be made on blood or nutrient agar for subsequent testing. Best results are obtained from enriched media such as blood agar or nutrient agar. The use of fresh cultures grown overnight is recommended. Select 2-5 isolated colonies of the suspect staphylococci from the primary medium.
6. Take a mixing stick and pick up some of the culture by touching it with the flat end of the stick. As a guide, an amount of growth roughly equivalent to 6 average sized colonies should be picked.
7. Emulsify the sample of culture in a drop of latex by rubbing with the flat end of the stick. Rub thoroughly, but not too vigorously or the surface of the card may be damaged. Spread the latex over approximately half of the area of the circle. Discard the mixing stick.
8. Rotate the card gently for up to 20 seconds and examine for agglutination, holding the card at normal reading distance from the eyes. Do not use a



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magnifying lens. The patterns obtained are clear cut and can be recognized under normal lighting conditions.

9. Dispose of the card –do not reuse.

### Quality Controls:

Controls are to be run each day of use prior to testing patient samples.

Under normal circumstances it will become apparent if the reagent fails to operate properly. The latex suspension should always be inspected for granularity as it is dropped onto the test card. Some granularity can be removed by shaking vigorously, but if there is evidence of auto-agglutination, the suspension should not be used.

*S.aureus* ATCC 25923 (Stock Organism #2) is to be used as a positive control.

*S.epidermidis* ATCC 12228 (Stock Organism #83) is to be used as a negative control.

### Interpretation:

- Positive - A positive result is indicated by the development of an agglutinated pattern showing clearly visible clumping of the latex particles with clearing of the milky background. Most positive reactions will be almost instantaneous.
- Negative - A negative result is indicated when the latex does not agglutinate and the milky appearance remains substantially unchanged throughout the test. It should also be noted that traces of granularity may be seen in negative patterns due to the particulate nature of both reactants. Increased granularity may be observed if the latex suspensions are rotated for more than 20 seconds.

Rough or stringy reactions appear as white specks or stringy aggregates and should be interpreted as follows:

1. When accompanied by a milky background they should be recorded as negative.
2. When accompanied by a clear background they are likely to be positive.



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## Limitations:

1. Specimens grown on high-salt supplemented media such as mannitol-salt agar tend not to emulsify well giving a rough or stringy reaction and may be relatively weak in their protein A and coagulase content.
2. Some species of Staphylococcus in addition to *S.aureus* notably *S.hyicus* and *S.intermedius* may give positive results in conventional coagulase tests, and may also react in the latex procedure. If necessary these species may be identified by biochemical test procedures; but they are not considered to be of major clinical significance in man.
3. Some other coagulase negative staphylococcal species, such as *S.capitis* possess plasma protein binding factors, but these do not react in the Staphaurex Test. However, a few strains identified biochemically as *S.saprophyticus* have given weak positive reactions and further identification of urinary isolates may be required.
4. Some streptococci and possibly other organisms possess immunoglobulin or other plasma protein binding factors which can react in the latex test and there are several species such as *E.coli* and *C.albicans* which are able to non-specifically agglutinate latex particles. To eliminate potential interference from these organisms a Gram stain should be performed so that only organisms with staphylococcal morphology are tested.

## References:

Staphaurex Kit Package Insert. Remel, Dartford, Kent, DA2 6PT, UK, Revised November 2011.



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