Comparison of the Efficiency of Bacterial Transport Among Three Clinical Specimen Transport Systems

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Abstract/Introduction

One of the routine procedures in the diagnosis of bacterial infections involves the collection and transport of specimens from the patient to the laboratory. Because of their ease of use and accessibility, swab systems with transport media included in the package are used to transport specimens to the laboratory. These systems must be able to maintain the viability of the specimens until they reach their destination. The swabs should be nontoxic, collect a significant amount of the specimen, allow for viability of the specimen until it reaches the transport media and easily release the specimen. The purpose of this experiment was to determine if the Copan Eswab is as good as or better than the BBL CultureSwab and Remel BactiSwab on the recovery of *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*. A 0.5 McFarland Standard was made and diluted down to a $1.5x10^4$ CFU/ml solution by performing four 10-fold dilutions in 0.45% sterile saline. The swabs were placed in 100-µl of each dilution and inoculated onto the trypticase soy agar and incubated at 35-37°C for 24-48 hours. The numbers of colonies were counted and compared for each transport system. The Copan Eswab recovered more *S. aureus* bacteria than the other two swabs. The Copan Eswab also recovered more bacteria than the BBL CultureSwab for both *E. coli* and *P. aeruginosa*.

Purpose

The purpose of this experiment was to determine if the Copan Eswab is as good as or better than the BBL CultureSwab and Remel BactiSwab on the recovery of *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphloccocus aureus.*

Methods

A solution with a concentration equal to a 0.5 McFarland standard was made. Four ten-fold dilutions were done to dilute it down to $1.5x10^4$ CFU/mL. 100µL of the $1.5x10^4$CFU/mL solution was placed in a separate test tube. Each swab was placed in the liquid for 15 seconds then plated. This was done for all three swab transport systems. The experiment was done in triplicate using three different types of bacteria for a total of 27 trials. After the bacteria were plated, they were left to incubate at 35-37°C for 24-48 hours.

Results

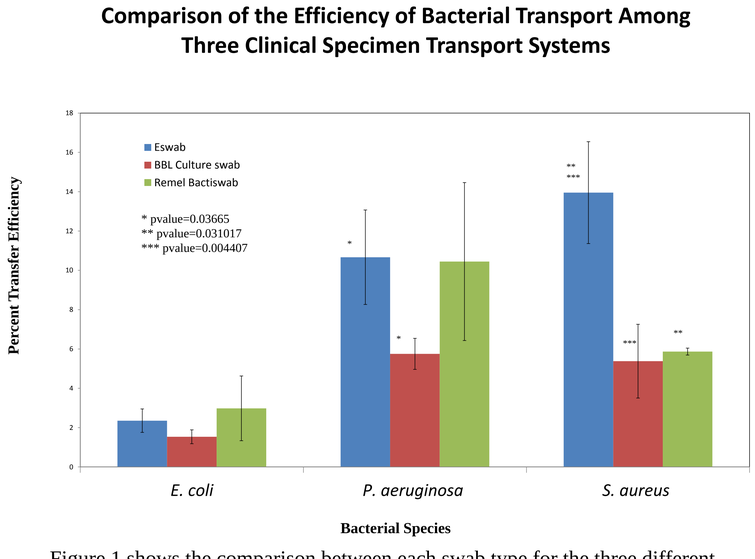
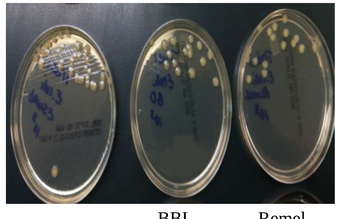


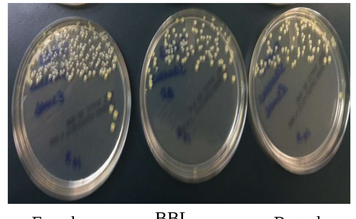
Figure 1 shows the comparison between each swab type for the three different types of bacteria. Also shown in the chart are three p values.

Escherichia coli



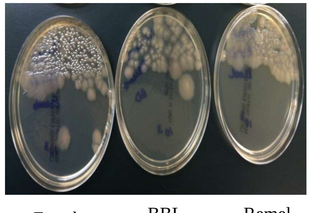
Eswab | BBL cultureswab | Remel Bactiswab

Staphylcoccus aureus



Eswab | BBL cultureswab | Remel Bactiswab

Pseudomonas aeruginosa



Eswab | BBL cultureswab | Remel Bactiswab

Conclusion/Discussion

The Eswab appeared to be statistically better than the BBL CultureSwab for both *P. aeruginosa* and *S. aureus.* Also, the Eswab appeared to be statistically better than the Remel BactiSwab for *S. aureus.* These results could be attributed to the flocking of the Eswab applicator or to surface characteristics of the bacteria such as capsules, pili, slime, fimbriae, and lipopolysaccharides. The Eswab is made of nylon and the BBL CultureSwab and Remel BactiSwab are both made from rayon, which also could have attributed to better adherence.

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