

# Comparison of two laboratory protocols for detection of carbapenem resistant Enterobacteriaceae

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## Background

Carbapenem resistant bacteria have been increasingly reported worldwide. Timely and accurate detection of such organisms in screening samples is of crucial importance for infection control purposes.

CDC Laboratory Protocol for Detection of Carbapenem-Resistant or Carbapenemase-Producing, *Klebsiella* spp. and *E.coli* from rectal swabs recommends the use of selective enrichment broth and MacConkey agar. The arrival of more selective media for detection of carbapenemase-producing Enterobacteriaceae (CPE) enables more specific screening for these bacteria. We compared the two protocols with special emphasis on sensitivity and time to reporting, both of which are very important in the successful infection control.

## Results

Out of 158 specimens analysed, 14 CPE were detected, 10 were positive with CDC protocol and CARBA methods, and 4 were positive only on CARBA plates. After 24h of incubation, 11 strains grew on CARBA plates, and additional 3 grew within next 24h. Sensitivity of chromID® CARBA was 100 % in clinical samples, chrom ID™ OXA-48 92.3%. Specificity was 78.3% and 95.9 % respectively. Average (arithmetic mean) time to positive reporting for CDC protocol was 4.4 days (CI=3.4-5.3), for chromID® CARBA and chrom ID™ OXA-48 was 3.9 (CI=2.9-4.8), and 3.3 (CI=2.5-4.1) respectively.

## Material/methods

Upon admission, 158 rectal swabs or stools were taken from patients in ICU. Either stools or swabs were inoculated onto the solid media chromID® CARBA, chrom ID™ OXA-48 and MacConkey agar after enrichment in trypticase soy broth according to CDC protocol. All CARBA plates were incubated at 37 °C and inspected for growth after 24 and 48h. Suspected colonies from all procedures were identified to species level and tested for carbapenem susceptibility by phenotypic tests. All carbapenem non-susceptible isolates were tested by combined disk-test and positive results were confirmed by PCR testing for carbapenemase gene detection.

## Conclusions

ChromID® CARBA and chrom ID™ OXA-48 agar plates showed greater sensitivity and specificity than CDC protocol. Based on this results we conclude that the use of enrichment broth does not improve recovery of CPE and prolongs time to reporting.

