

Blood cultures obtained from central venous catheters contain significantly greater volume than those obtained via peripheral venipuncture” Jones et al (2017).

Abstract:

OBJECTIVE: To identify clinical variables that influence blood culture volume recovery.

DESIGN: Retrospective chart review and linear model analysis.

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SETTING: A 621-bed Academic Medical Center with a Clinical Laboratory that processes 20,000+ blood cultures annually and dedicated phlebotomy staff for venipuncture.

PATIENTS: Consecutive patients requiring blood culture.

METHODS: Over a 6-day period, blood volume was determined in 568 culture bottles from 128 unique adult patients, and clinical data from the time of phlebotomy were extracted from hospital electronic medical records. Conditional hierarchical linear models with random effects for patient and phlebotomy occasion were utilized to analyze correlations between values collected from the same patient and during the same phlebotomy occasion.

RESULTS: Blood samples obtained from a central venous catheter yielded, on average, 2.53 mL more blood (95% CI, 1.63-3.44 mL; $P < .001$) than those from peripheral venipuncture, and aerobic bottles contained 0.38 mL more blood (95% CI, 0.1-0.67 mL; $P = .009$) than the anaerobic bottles. The remaining clinical variables (eg, hospital department, patient age, body mass index, gender, mean arterial pressure, concomitant systemic antibiotic use, and Charlson comorbidity index score) failed to reach statistical significance ($P < .05$) in relation to volume.

CONCLUSIONS: Blood cultures obtained from central venous catheters contain significantly greater volume than those obtained via peripheral venipuncture. These data highlight the

clinically significant issue of low culture volume recovery, indicate that diagnostic and prognostic tools that rely on volume-dependent phenomena (ie, time to positivity) may require further validation under usual clinical practice circumstances, and suggest goals for future institutional performance improvement.

Reference:

Jones, R.L., Sayles, H.R., Fey, P.D. and Rupp, M.E. (2017) Effect of Clinical Variables on the Volume of Blood Collected for Blood Cultures in an Adult Patient Population. *Infection Control and Hospital Epidemiology*. November 21st. .

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