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Laura Heireman, Pieter Van Geel, Lorenz Musger, Evelien Heylen, Wim Uyttenbroeck, Boris Mahieu

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Causes, consequences and management of sample hemolysis in the clinical laboratory

Laura Heireman[1], Pieter Van Geel[2], Lorenz Musger[1], Evelien Heylen[1], Wim Uyttenbroeck[1], Boris Mahieu[1]

[1]Department of Laboratory Medicine, Ziekenhuis Netwerk Antwerpen, Antwerp, Belgium

[2]Department of Orthopedic Surgery, Ziekenhuis Netwerk Antwerpen, Antwerp, Belgium

Corresponding author: Laura Heireman, Department of Laboratory Medicine, Ziekenhuis Netwerk Antwerpen, Lindendreef 1, 2020 Antwerp, Belgium. E-mail: heireman.laura@gmail.com

Abstract

Preanalytical hemolysis of blood samples is a common problem in medical practice, especially in emergency departments. Several potential influences on sample hemolysis have been investigated, including sampling techniques, centrifugation and sample transport. In particular, the use of intravenous catheters and the vacuum sampling technique have often been demonstrated to provoke hemolysis. Other factors playing a role include the use of inappropriate puncture sites, complicated blood sampling, prolonged tourniquet application, underfilling of tubes and excessive shaking of specimens. Training of phlebotomists can play a pivotal role in overcoming these issues. A sample may also undergo hemolysis at the point of centrifugation, more specifically when centrifugation lasts too long or is done repeatedly. Pneumatic tube system (PTS)-transported samples tend to be more strongly affected by hemolysis compared to hand-carried ones, though whether this difference is clinically relevant remains questionable. The velocity at which the sample moves, the distance it covers