

EFFICACY OF NANOPARTICLES IN ACHIEVING HEMOSTASIS

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ABSTRACT

Uncontrollable hemorrhage is significant cause of preventable death in the military and civilian setting. Hemostatic wound dressings have been created in an attempt to rectify this problem, but none currently on the market are highly effective at controlling hemorrhage resulting in a need for an effective hemostatic wound dressing. This study investigated the effects of gold, silver, and silica nanoparticles on blood coagulation time in order to determine if nanoparticle incorporation into a hemostatic wound dressing would effectively achieve hemostasis. Gold, silver, and silica nanoparticles were experimented with two different *ex vivo* studies to determine their effects on coagulation. A modified Lee White Method and a rotational viscometer were utilized to assess the nanoparticles ability to clot blood. Results obtained from the modified Lee White Method proved inconsistent and inconclusive demonstrating a need for improved testing methods. Results acquired from viscometer testing demonstrated that silica was effective in decreasing coagulation time indicating its potential use as a hemostatic agent and its prospective incorporation into a hemostatic wound dressing.