

# An In-Vitro Determination of Platelet Gel Efficacy as Prevention of Post-Operative Bacterial Infections

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## Abstract

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- Background:** Clinical studies have shown that platelet gel may have advantageous effects on wound healing due to the growth factors platelets release when activated. Since platelet gel also contains leukocytes, or white blood cells, it is hypothesized that application of the gel to surgical wounds will reduce or possibly eliminate bacterial growth. *Pseudomonas*, *Staphylococcus Aureus*, and *Enterococci* are three of the most common bacteria found in surgical wounds. The incidence of bacterial infection in cardiac surgery patients has been shown to be as high as 21.7%. This confirms a need for better prevention of such infections, especially since many strains of bacteria are becoming resistant to conventional antibiotic treatments.
- Methods:** Fifty-five milliliters of human blood was collected into a syringe containing five milliliters of ACD. By using the Medtronic Magellan™, the blood was separated into red blood cells (RBC), platelet poor plasma (PPP), and platelet rich plasma (PRP). Platelet gel was then made by adding calcium and thrombin to the PRP. Four groups were established: the Control group, containing only the bacteria; Group A, containing PPP and the bacteria; Group B, containing PRP and the bacteria; and Group C, containing RBC and the bacteria. Bacteria *Pseudomonas*, *Staphylococcus Aureus*, and *Enterococci* were plated using blood agar plates and incubated for three days at 37° Celsius.
- Results:** The PPP plates showed no visible inhibition of bacterial growth for any of the three bacteria. However, there was visible inhibition, with a marked bactericidal effect for two of the three bacteria in the PRP plates. Also, in the RBC plates, there was some visible inhibition of bacterial growth for two of the three bacteria.
- Conclusions:** Platelet rich plasma is effective in preventing *Pseudomonas* and *Staphylococcus Aureus* bacterial growth. It also has a bactericidal effect, which makes it a valuable asset to wound maintenance and healing.