

**Neurosurgery Abstracts**

**Title:** ACTIVITY OF AN ANTIMICROBIAL CSF SHUNT CATHETER AGAINST THREE MAJOR SHUNT PATHOGENS

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**Background:** Shunt infection rates vary but are generally considered to be too high. The commonest infecting bacteria are Staphylococcus epidermidis, Staphylococcus aureus and Propionibacterium acnes. These are usually derived from the patient's skin at surgery, and skin prep regimens and prophylactic antibiotics play only a minor role in preventing their access to the new shunt. We have developed an antimicrobial shunt catheter intended to kill skin bacteria that attach to it, and we present here the supporting laboratory data on its antimicrobial activity.

**Method:** These are designed to test killing kinetics of attached bacteria, and ability of the catheters to withstand repeated bacterial challenge under constant flow conditions. The tK100 assay was used to measure the time taken to kill 100% of bacteria attached to the shunt surface. The in vitro challenge test determined whether the catheters became colonized by bacteria while fluid was flowing through them when challenged by bacteria three times over 28 days. Test bacteria were S epidermidis, meticillin – resistant S aureus, and P acnes.

**Results:** The tK100 assay showed that the catheters killed 100% of attached bacteria, the staphylococci within 48hr and the P acnes within 5 days. The in vitro challenge test showed that the catheters were able to withstand three high – number challenges of all three bacteria over a 28 – day period without becoming colonized. Plain catheter controls became colonized after each challenge.

**Conclusion:** The antimicrobial shunt catheters killed all attached test bacteria typical of common shunt pathogens, supporting their clinical use in reducing the rate of shunt infection.