

# Shunt Infection Epidemiology

Soon after cerebrospinal fluid (CSF) shunts became available in the late 1950s, infection was recognized as a serious complication of their use, although the bacterial cause of the infections and the way in which they arose was not clarified for a number of years. Subsequent research has since revealed their etiology and provided data that have improved the understanding of aspects of diagnosis, treatment, and prevention <sup>1)</sup>.

Acceptable [shunt infection](#) rate < 5 - 7 % <sup>2)</sup> (although many published series have a rate near 20 % <sup>3)</sup>, possibly due to different patient population).

Risk of early infection after shunt surgery: reported range is 3-20 % per procedure (typically  $\approx$  7 %).

It is estimated that in  $\approx$  3 % of operations of Shunt insertion the CSF is already infected (therefore CSF during shunt insertion is recommended).

Over 50 % of staph infections occur within 2 weeks post-shunt, 70 % within 2 mos. Source is often the patient's own skin <sup>4)</sup>.

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Despite improvements in perioperative antibiotic therapy and surgical technique, shunt [infection](#) remains the most morbid and financially significant complication associated with [shunt surgery](#) for the treatment of hydrocephalus in both pediatric and adult patients <sup>5) 6) 7) 8)</sup>.

## Case series

During a 10-year period shunt infections occurred in 27% of the 289 hydrocephalic patients who had cerebrospinal fluid shunts inserted at Children's Hospital Medical Center. The rate of infection did not vary with the type of shunt. Staphylococcus epidermidis and Staphylococcus aureus were responsible for one-half and one-quarter of the infections, respectively. Removal of the infected shunt in conjunction with administration of systemic antibiotics was effective therapy. Use of systemic antibiotics alone was generally ineffective and was associated with an increased mortality rate. Infection itself was a significant risk factor, raising the mortality rate from 17% to 40%. Clustering of infection within two months of surgery and similar rates of infection for ventriculo-atrial and ventriculo-peritoneal shunts indicate that the infecting organisms are usually introduced during the perioperative period. The possibility that prophylactic antibiotics or different shunt materials might reduce the infection rate requires further study <sup>9)</sup>.

<sup>1)</sup>

Bayston R. Epidemiology, diagnosis, treatment, and prevention of cerebrospinal fluid shunt infections. Neurosurg Clin N Am. 2001 Oct;12(4):703-8, viii. PubMed PMID: 11524291.

<sup>2)</sup> , <sup>4)</sup>

Yogev R. Cerebrospinal fluid shunt infections: a personal view. Pediatr Infect Dis. 1985 Mar-Apr;4(2):113-8. Review. PubMed PMID: 3885175.

<sup>3)</sup>

Ammirati M, Raimondi AJ. Cerebrospinal fluid shunt infections in children. A study on the relationship between the etiology of hydrocephalus, age at the time of shunt placement, and infection rate. Childs

Nerv Syst. 1987;3(2):106-9. PubMed PMID: 3621226.

<sup>5)</sup>

F.J. Attenello, G.L. Garces-Ambrossi, H.A. Zaidi, D.M. Sciubba, G.I. Jallo Hospital costs associated with shunt infections in patients receiving antibiotic-impregnated shunt catheters versus standard shunt catheters Neurosurgery, 66 (2010), pp. 284–289 [discussion 289]

<sup>6)</sup>

R.O. Darouiche Treatment of infections associated with surgical implants N Engl J Med, 350 (2004), pp. 1422–1429

<sup>7)</sup>

S.H. Farber, S.L. Parker, O. Adogwa, D. Rigamonti, M.J. McGirt Cost analysis of antibiotic-impregnated catheters in the treatment of hydrocephalus in adult patients World Neurosurg, 74 (2010), pp. 528–531

<sup>8)</sup>

R.V. Patwardhan, A. Nanda Implanted ventricular shunts in the United States: the billion-dollar-a-year cost of hydrocephalus treatment Neurosurgery, 56 (2005), pp. 139–144 [discussion 144–145]

<sup>9)</sup>

Schoenbaum SC, Gardner P, Shillito J. Infections of cerebrospinal fluid shunts: epidemiology, clinical manifestations, and therapy. J Infect Dis. 1975 May;131(5):543-52. PubMed PMID: 1127260.

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