

Silver-impregnated, antibiotic-impregnated or non-impregnated ventriculoperitoneal shunts to prevent shunt infection: the BASICS three-arm RCT

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Declared competing interests of authors: Michael J Griffiths has a patent 068347A1 pending for a novel method of detection of bacterial infection. Tom Solomon reports grants from the National Institute for Health Research (NIHR) outside the submitted work and other support from the Data Safety and Monitoring Committee of the GlaxoSmithKline plc (London, UK) study to evaluate the safety and immunogenicity of a candidate ebola vaccine in children (GSK3390107A) (ChAd3 EBO-Z), outside the submitted work. He also chairs the Siemens Healthineers (Munich, Germany) Clinical Advisory Board. Dyfrig Hughes was member of the Health Technology Assessment (HTA) programme Pharmaceuticals Panel (2008–12) and the HTA programme Clinical Evaluation and Trials board (2010–16). Carrol Gamble reports grants from NIHR outside the submitted work and is a member of the NIHR Efficacy and Mechanism Evaluation programme committee (January 2015–present).

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Plain English summary

The BASICS three-arm RCT

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Plain English summary

Hydrocephalus (commonly known as ‘water on the brain’) is a condition that can affect all age groups, from babies to the elderly. In hydrocephalus, there is an accumulation of the normal brain fluid in the fluid cavities (ventricles) of the brain. Untreated, hydrocephalus can be life-threatening. The most common treatment involves an operation to insert a tube into the swollen ventricles to drain off the excess fluid. This is called a ventriculoperitoneal shunt.

In the UK, 3000–3500 shunt operations are performed each year. The main risks of a shunt operation are infection (surgical meningitis) and blockage without infection. Infection results in the need for at least two further surgeries, antibiotic treatment and a prolonged hospital stay (minimum of 2 weeks). Shunt infections can affect mental abilities and can be life-threatening. People who have blockages without infection, on the other hand, usually need only a single operation to replace the blocked part and only a few days in hospital.

Two new types of shunt catheter have been introduced to try to reduce shunt infection: antibiotic-impregnated shunts and silver-impregnated shunts. This study was designed to assess whether or not either of these new shunts reduce infection compared with standard shunts. This study also included an analysis of the cost and health benefits of the different shunts used.

A total of 1605 children and adults, who were treated in neurosurgical units across the UK and the Republic of Ireland, participated in this study. Consent was provided by all participants in the trial. Each participant had an equal chance of receiving one of the three shunt types.

Shunt infection occurred in 6% of participants receiving standard shunts, 5.9% of participants receiving silver-impregnated shunts and 2.2% of participants receiving antibiotic-impregnated shunts.

This study has demonstrated a major reduction in shunt infections in new shunts when using antibiotic-impregnated shunts compared with standard or silver-impregnated shunts. A health economic analysis has indicated that antibiotic-impregnated shunts are cost-saving.

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This report

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