

Antimicrobial-impregnated central venous catheters for preventing neonatal bloodstream infection: the PREVAIL RCT

Ruth Gilbert,^{1,2*} Michaela Brown,³ Rita Faria,⁴ Caroline Fraser,¹ Chloe Donohue,³ Naomi Rainford,³ Alessandro Grosso,⁴ Ajay K Sinha,⁵ Jon Dorling,⁶ Jim Gray,⁷ Berit Muller-Pebody,⁸ Katie Harron,¹ Tracy Moitt,³ William McGuire,⁹ Laura Bojke,⁴ Carrol Gamble³ and Sam J Oddie^{9,10} on behalf of the PREVAIL team

¹UCL Great Ormond Street Institute of Child Health, Faculty of Population Health Sciences, University College London, London, UK

²Health Data Research UK, London, UK

³Liverpool Clinical Trials Centre, University of Liverpool, Liverpool, UK

⁴Centre for Health Economics, University of York, York, UK

⁵Barts Health NHS Trust, London, UK

⁶Division of Neonatal-Perinatal Medicine, Dalhousie University IWK Health Centre, Halifax, NS, Canada

⁷Birmingham Women's and Children's NHS Foundation Trust, Birmingham, UK

⁸National Infection Service, Public Health England, London, UK

⁹Centre for Reviews and Dissemination, University of York, York, UK

¹⁰Bradford Neonatology, Bradford Royal Infirmary, Bradford, UK

*Corresponding author r.gilbert@ucl.ac.uk

Declared competing interests of authors: Ruth Gilbert receives funding from Health Data Research UK. Ajay K Sinha reports that he was a member of the Health Technology Assessment (HTA) Women and Children Health panel between January 2017 and January 2018, during the conduct of the study. Jon Dorling reports grants from the National Institute for Health Research (NIHR) during the conduct of the study, outside the submitted work (RP-PG-0609-10107); Jon Dorling was also a member of the NIHR HTA General Board (from 2017 to 2018) and the NIHR HTA Maternity, Newborn and Child Health Panel (from 2013 to 2018). He was also funded by Nutrinia Ltd (Ramat Gan, Israel) in 2017 and 2018 for part of his salary to work as an expert advisor on a trial of enteral insulin. Katie Harron reports grants from the Wellcome Trust (grant number 103975/A/14/Z) during the conduct of the study. William McGuire reports membership of the HTA Commissioning Committee during the life of the project, and membership of the HTA and Efficacy and Mechanism Evaluation (EME) programme editorial boards. Laura Bojke is a member of the NIHR Health Services and Delivery Research researcher-led panel for stage 1 proposals (November 2019 to present). Carrol Gamble is a member of the EME funding board (November 2019 to present).

Published November 2020

DOI: 10.3310/hta24570

Plain English summary

The PREVAIL RCT

Health Technology Assessment 2020; Vol. 24: No. 57

DOI: [10.3310/hta24570](https://doi.org/10.3310/hta24570)

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Plain English summary

Babies who are born too early or who are very sick require intensive care after birth and during early life. Most will have a long, narrow, plastic tube, called a catheter, inserted into a vein. The catheter is used to give babies fluids containing medicines and nutrition to keep them well and help them grow.

The catheter can remain in place for several days or weeks. But the presence of plastic tubing in the vein increases the risk of infection. This study aimed to find out whether or not catheters coated with antimicrobial medicines, called rifampicin and miconazole, could reduce the risk of infection. These medicines act by stopping germs from growing on the catheter, but do not harm the baby or interfere with other treatments.

A randomised controlled trial was carried out in 18 neonatal units in England. Whenever a baby needed a catheter, their parents were asked for consent to participate in the trial. The baby was then randomised, similar to tossing a coin, to receive either the antimicrobial catheter or a standard one. A total of 861 babies participated. We followed up all babies in the same way until after the catheter was removed to compare how often babies in each group had an infection.

It was found that antimicrobial catheters were no better or worse at preventing infection than standard catheters. Antimicrobial catheters cost more and we found no evidence of benefit; these results suggest that their use in neonatal intensive care is not justified. It was calculated that further research on ways to reduce infection may be good value for money, depending on the costs of this research. The babies who took part in this study were typical of babies in England receiving catheters, meaning that the results can be applied across the NHS. Future research should focus on catheters that contain other types of antimicrobials and alternative ways of preventing infection.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 3.370

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, the Cochrane Library and Clarivate Analytics Science Citation Index.

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: journals.library@nihr.ac.uk

The full HTA archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hta. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Health Technology Assessment* journal

Reports are published in *Health Technology Assessment* (HTA) if (1) they have resulted from work for the HTA programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

Reviews in *Health Technology Assessment* are termed 'systematic' when the account of the search appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

HTA programme

Health Technology Assessment (HTA) research is undertaken where some evidence already exists to show that a technology can be effective and this needs to be compared to the current standard intervention to see which works best. Research can evaluate any intervention used in the treatment, prevention or diagnosis of disease, provided the study outcomes lead to findings that have the potential to be of direct benefit to NHS patients. Technologies in this context mean any method used to promote health; prevent and treat disease; and improve rehabilitation or long-term care. They are not confined to new drugs and include any intervention used in the treatment, prevention or diagnosis of disease.

The journal is indexed in NHS Evidence via its abstracts included in MEDLINE and its Technology Assessment Reports inform National Institute for Health and Care Excellence (NICE) guidance. HTA research is also an important source of evidence for National Screening Committee (NSC) policy decisions.

This report

The research reported in this issue of the journal was funded by the HTA programme as project number 12/167/02. The contractual start date was in December 2014. The draft report began editorial review in September 2019 and was accepted for publication in May 2020. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care.

© Queen's Printer and Controller of HMSO 2020. This work was produced by Gilbert *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health and Social Care. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).

Editor-in-Chief of *Health Technology Assessment* and NIHR Journals Library

Professor Ken Stein Professor of Public Health, University of Exeter Medical School, UK

NIHR Journals Library Editors

Professor John Powell Chair of HTA and EME Editorial Board and Editor-in-Chief of HTA and EME journals. Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK, and Professor of Digital Health Care, Nuffield Department of Primary Care Health Sciences, University of Oxford, UK

Professor Andrée Le May Chair of NIHR Journals Library Editorial Group (HS&DR, PGfAR, PHR journals) and Editor-in-Chief of HS&DR, PGfAR, PHR journals

Professor Matthias Beck Professor of Management, Cork University Business School, Department of Management and Marketing, University College Cork, Ireland

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Eugenia Cronin Senior Scientific Advisor, Wessex Institute, UK

Dr Peter Davidson Consultant Advisor, Wessex Institute, University of Southampton, UK

Ms Tara Lamont Senior Scientific Adviser (Evidence Use), Wessex Institute, University of Southampton, UK

Dr Catriona McDaid Senior Research Fellow, York Trials Unit, Department of Health Sciences, University of York, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Emeritus Professor of Wellbeing Research, University of Winchester, UK

Professor John Norrie Chair in Medical Statistics, University of Edinburgh, UK

Professor James Raftery Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

Dr Rob Riemsma Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

Professor Helen Roberts Professor of Child Health Research, UCL Great Ormond Street Institute of Child Health, UK

Professor Jonathan Ross Professor of Sexual Health and HIV, University Hospital Birmingham, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Professor Ken Stein Professor of Public Health, University of Exeter Medical School, UK

Professor Jim Thornton Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

Professor Martin Underwood Warwick Clinical Trials Unit, Warwick Medical School, University of Warwick, UK

Please visit the website for a list of editors: www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: journals.library@nihr.ac.uk