

CAThether Infections in Children (CATCH): a randomised controlled trial and economic evaluation comparing impregnated and standard central venous catheters in children

Katie Harron,¹ Quen Mok,² Kerry Dwan,³
Colin H Ridyard,⁴ Tracy Moitt,³ Michael Millar,⁵
Padmanabhan Ramnarayan,² Shane M Tibby,⁶
Berit Muller-Pebody,⁷ Dyfrig A Hughes,⁴
Carrol Gamble³ and Ruth E Gilbert^{1*}

¹Institute of Child Health, University College London, London, UK

²Great Ormond Street Hospital, London, UK

³Medicines for Children Clinical Trials Unit, University of Liverpool, Liverpool, UK

⁴Centre for Health Economics and Medicines Evaluation, Bangor University,
Bangor, UK

⁵Barts Health NHS Trust, London, UK

⁶Evelina London Children's Hospital, London, UK

⁷Healthcare Associated Infection and Antimicrobial Resistance (HCAI & AMR)
Department, National Infection Service, Public Health England, London, UK

*Corresponding author

Declared competing interests of authors: Michael Millar was a member of the National Institute for Health Research Health Technology Assessment Diagnostic Technologies and Screening Panel for the duration of the CATCH study.

Published March 2016

DOI: 10.3310/hta20180

Plain English summary

CAtHeter Infections in CHildren (CATCH)

Health Technology Assessment 2016; Vol. 20: No. 18

DOI: 10.3310/hta20180

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

Plain English summary

Children who are admitted to hospital for intensive care often need to have medicines given directly into their veins, through a small plastic tube called a central venous catheter (CVC). CVCs avoid the need for repeated injections, but their disadvantage is an increased risk of bloodstream infection (BSI), which can result in prolonged treatment and time in hospital.

In adults, CVCs coated with medicine to kill bacteria (antibiotics) or prevent clots (heparin) help reduce the risk of BSI. However, we do not know if coating the much narrower CVCs used for children would work in the same way. The only way to find out which type of CVC (standard non-coated, antibiotic coated or heparin coated) works best was to carry out a randomised controlled trial.

Children aged < 16 years who needed a CVC for intensive care treatment participated within 14 hospitals in England. Consent was provided for all participants in the trial. Each child had an equal chance of receiving one of the three CVC types.

Bloodstream infection occurred in 4% of children with standard CVCs and 2% of those with impregnated CVCs. Rates of BSI were lowest in the antibiotic CVC group (1%) but these children had slightly higher health-care costs for the 6 months after trial participation. Although doubt remains whether or not antibiotic CVCs would result in cost savings for the NHS in England, our results suggest that using antibiotic CVCs could help reduce BSI rates for children in intensive care.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 5.027

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, The Cochrane Library and the ISI 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: nhredit@southampton.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

The HTA programme, part of the National Institute for Health Research (NIHR), was set up in 1993. It produces high-quality research information on the effectiveness, costs and broader impact of health technologies for those who use, manage and provide care in the NHS. 'Health technologies' are broadly defined as all interventions used to promote health, prevent and treat disease, and improve rehabilitation and long-term care.

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.

For more information about the HTA programme please visit the website: <http://www.nets.nihr.ac.uk/programmes/hta>

This report

The research reported in this issue of the journal was funded by the HTA programme as project number 08/13/47. The contractual start date was in March 2010. The draft report began editorial review in May 2015 and was accepted for publication in October 2015. 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. 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.

© Queen's Printer and Controller of HMSO 2016. This work was produced by Harron *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. 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).

Health Technology Assessment Editor-in-Chief

Professor Hywel Williams Director, HTA Programme, UK and Foundation Professor and Co-Director of the Centre of Evidence-Based Dermatology, University of Nottingham, UK

NIHR Journals Library Editor-in-Chief

Professor Tom Walley Director, NIHR Evaluation, Trials and Studies and Director of the HTA Programme, UK

NIHR Journals Library Editors

Professor Ken Stein Chair of HTA Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

Professor Andree Le May Chair of NIHR Journals Library Editorial Group (EME, HS&DR, PGfAR, PHR journals)

Dr Martin Ashton-Key Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

Professor Matthias Beck Chair in Public Sector Management and Subject Leader (Management Group), Queen's University Management School, Queen's University Belfast, UK

Professor Aileen Clarke Professor of Public Health and Health Services Research, Warwick Medical School, University of Warwick, UK

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Peter Davidson Director of NETSCC, HTA, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Professor Elaine McColl Director, Newcastle Clinical Trials Unit, Institute of Health and Society, Newcastle University, UK

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

Professor Geoffrey Meads Professor of Health Sciences Research, Health and Wellbeing Research and Development Group, University of Winchester, UK

Professor John Norrie Health Services Research Unit, University of Aberdeen, UK

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), 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 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 Jim Thornton Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

Please visit the website for a list of members of the NIHR Journals Library Board:
www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: nihredit@southampton.ac.uk