# Delivery, dose, outcomes and resource use of stroke therapy: the SSNAPIEST observational study

Matthew Gittins,<sup>1</sup> David Lugo-Palacios,<sup>2</sup> Andy Vail,<sup>1</sup> Audrey Bowen,<sup>3</sup> Lizz Paley,<sup>4</sup> Benjamin Bray,<sup>4</sup> Brenda Gannon<sup>5</sup> and Sarah F Tyson<sup>6</sup>\*

- <sup>1</sup>Centre for Biostatistics, School of Health Sciences, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK
- <sup>2</sup>Centre for Health Economics, School of Health Sciences, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK
- <sup>3</sup>Division of Neuroscience and Experimental Psychology, School of Biological Sciences, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK
- <sup>4</sup>Sentinel Stroke National Audit Programme, Department of Population Health Sciences, King's College London, London, UK
- <sup>5</sup>School of Economics, The University of Queensland, Brisbane, QLD, Australia
- <sup>6</sup>Division of Nursing, Midwifery and Social Work, School of Health Sciences, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK

**Declared competing interests of authors:** Andy Vail, Audrey Bowen, Benjamin Bray and Sarah Tyson declare research grant funding from the National Institute for Health Research. Audrey Bowen was a member of the Intercollegiate Stroke Working Party (2002–16). In addition, Audrey Bowen's university salary is part funded by a personal award from the Stroke Association and stroke research grants from the National Institute for Health Research. Sarah Tyson is currently a member of the Intercollegiate Stroke Working Party (2019–present).

Published March 2020 DOI: 10.3310/hsdr08170

# Plain English summary

The SSNAPIEST observational study
Health Services and Delivery Research 2020: Vol. 8: No. 17

DOI: 10.3310/hsdr08170

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

<sup>\*</sup>Corresponding author Sarah.tyson@manchester.ac.uk

## **Plain English summary**

Physical, occupational and speech therapy plus psychology are key to recovery after a stroke, yet most patients receive very little. We wanted to understand why. We analysed data from the Sentinel Stroke National Audit Programme, which includes details of all stroke patients in England, Wales and Northern Ireland from 2013 to 2015.

Nearly all patients who needed therapy received it, but only 5% were reported to need psychology. This may be an underestimate, as services are often unavailable. The amount of therapy per day of stay was low: between 2 minutes (psychology) and 14 minutes (physiotherapy). Therapy was also infrequent; most patients received treatment on only 20–60% of the days when they needed it.

The amount of therapy received by the patient was related to the patient's characteristics (e.g. stroke severity) and the organisation treating them, for example the type of stroke unit, therapy and nurse staffing levels, and the presence of weekend therapy and early supported discharge services.

We found that patients took highly varied routes through stroke services, but we identified four common pathways. We also developed a new way of categorising patients according to their problems. This could be used to work out what therapy patients should receive.

We found that the need for therapy and the amount of therapy per day were associated with the cost of inpatient stroke care: the more therapy, the lower the cost. There was much unexplained variation in costs between stroke care teams.

Greater amounts of any type of therapy were associated with shorter hospital stays and fewer deaths. The relationship between the amount of therapy and other outcomes was complex and needs further exploration. We also need more research to find out how therapies should be targeted to patients with different needs and how best to organise stroke therapy services.

## **Health Services and Delivery Research**

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

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 HS&DR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hsdr. 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 Services and Delivery Research journal

Reports are published in *Health Services and Delivery Research* (HS&DR) if (1) they have resulted from work for the HS&DR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

#### **HS&DR** programme

The HS&DR programme funds research to produce evidence to impact on the quality, accessibility and organisation of health and social care services. This includes evaluations of how the NHS and social care might improve delivery of services.

For more information about the HS&DR programme please visit the website at https://www.nihr.ac.uk/explore-nihr/funding-programmes/health-services-and-delivery-research.htm

#### This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 14/198/09. The contractual start date was in April 2016. The final report began editorial review in February 2019 and was accepted for publication in November 2019. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report 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 HS&DR 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 HS&DR programme or the Department of Health and Social Care.

© Queen's Printer and Controller of HMSO 2020. This work was produced by Gittins *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 Services and Delivery Research** 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 Senior Clinical Researcher, 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 Director, NIHR Dissemination Centre, 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 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