

# Clinical effectiveness and cost-effectiveness of parenting interventions for children with severe attachment problems: a systematic review and meta-analysis

Barry Wright,<sup>1,2\*</sup> Melissa Barry,<sup>2</sup> Ellen Hughes,<sup>2</sup> Dominic Trépel,<sup>3</sup> Shehzad Ali,<sup>3</sup> Victoria Allgar,<sup>1</sup> Lucy Cottrill,<sup>2</sup> Steven Duffy,<sup>4</sup> Jenny Fell,<sup>2,3</sup> Julie Glanville,<sup>4</sup> Danya Glaser,<sup>5,6</sup> Lisa Hackney,<sup>2</sup> Laura Manea,<sup>1</sup> Dean McMillan,<sup>1,3</sup> Stephen Palmer,<sup>7</sup> Vivien Prior,<sup>8</sup> Clare Whitton,<sup>9</sup> Amanda Perry<sup>3</sup> and Simon Gilbody<sup>1,3</sup>

<sup>1</sup>Hull York Medical School, University of York, York, UK

<sup>2</sup>Leeds and York Partnership NHS Foundation Trust, Leeds, UK

<sup>3</sup>Department of Health Sciences, University of York, York, UK

<sup>4</sup>York Health Economics Consortium, York, UK

<sup>5</sup>Great Ormond Street Hospital, London, UK

<sup>6</sup>Research Department of Clinical, Educational and Health Psychology, University College London, London, UK

<sup>7</sup>Centre for Health Economics, University of York, York, UK

<sup>8</sup>Faculty of Population Health Sciences, Institute of Child Health, University College London, London, UK

<sup>9</sup>Tees, Esk and Wear Valleys NHS Foundation Trust, Middlesbrough, UK

\*Corresponding author

**Declared competing interests of authors:** none

Published July 2015

DOI: 10.3310/hta19520

## Scientific summary

### Parenting interventions for severe attachment problems

Health Technology Assessment 2015; Vol. 19: No. 52

DOI: 10.3310/hta19520

NIHR Journals Library [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

# Scientific summary

## Background

The concept of attachment describes the child's component of the caregiving bond between the infant and the primary caregiver, usually the mother. It allows the developing infant to explore the environment safely, to elicit care from a caregiver (seeking proximity during times of threat) and to learn how to cope with the challenges and anxieties presented in the environment. Various models and hypotheses suggest the importance of its influence on development.

Attachment is traditionally measured in two ways. The first involves identifying patterns of attachment (sometimes referred to as styles or attachment organisation). This involves coding the responses of an infant (usually aged between 9 and 18 months) to a series of encounters involving his or her primary caregiver and a stranger. The reference standard for this is the Strange Situation Procedure (SSP). This is not a diagnosis but a set of observed behaviours that present in one of a number of patterns. The second involves research diagnostic criteria (RDC) for attachment disorders, specified by both the American Psychiatric Association (APA) and the World Health Organization (WHO). The relationship between attachment patterns and attachment disorders is unclear. There is a wide narrative literature describing the importance of attachment problems in the developmental course of children. This has led to numerous interventions being developed in an attempt to improve attachment and reduce negative outcomes. This review has been requested in order to elucidate the literature on the clinical effectiveness and cost-effectiveness of parenting interventions for children with severe attachment problems. This will inform best practice by those delivering these programmes. After extensive discussion with the expert/patient and public involvement group, we defined severe attachment problems [a term coined by the National Institute for Health Research (NIHR) call] as disorganised attachment patterns, or attachment disorders in children as diagnosed by the WHO or the APA classification system.

## Objectives

The main objective specified in the Health Technology Assessment (HTA) programme call was to address the question 'What is the effectiveness and cost-effectiveness of early parenting interventions for parents whose children show signs of developing severe attachment problems?'

To achieve this we specified our main review objectives as follows:

1. to identify the range of intervention programmes that are designed for parents of children with severe attachment problems
2. to examine the clinical effectiveness of intervention programmes designed for parents of children with severe attachment problems
3. to examine the cost-effectiveness of intervention programmes designed for parents of children with severe attachment problems
4. to identify research priorities for developing future intervention programmes for children with severe attachment disorders, from the perspective of the UK NHS.

These four objectives formed the basis of the main systematic review.

We undertook supplementary reviews in order to support this work. These specifically focused on developing clarity around baseline measures of attachment and obtaining additional information about outcomes over 10 years, as most of the effectiveness studies reported outcomes that were short term. This was to provide additional information for the health economists. These objectives were as follows:

1. to review the methods of assessment and/or diagnosis of attachment patterns and/or disorders (supplementary systematic review 1)
2. to examine the 10-year or more outcomes among children with severe attachment problems and collect prevalence information from these studies (supplementary systematic review 2).

## Methods

A literature search was undertaken across 29 electronic databases and 11 internet sites. Examples of databases searched include PsycINFO (1806 to January week 1, 2012), MEDLINE and MEDLINE In-Process & Other Non-Indexed Citations (1946 to December week 4, 2011) and EMBASE (1974 to week 1, 2012). Information was gathered by personal communication and authors' contact details, and by identifying additional references through bibliographic lists. The systematic review was divided into one main review and two supplementary reviews as described above, and utilised different screening criteria and data extraction information for each stage of the review. Methods outlined by the Centre for Reviews and Dissemination and Cochrane were followed. For the main systematic review of clinical effectiveness and cost-effectiveness, we evaluated randomised controlled trial (RCT) evidence to assess the effectiveness of interventions to improve attachment patterns or attachment disorders. The Cochrane risk of bias tool was used to carry out quality assessment. We set out to gather enough information to populate a health economics decision model and carry out a value of information analysis. The first supplementary review considered the diagnostic accuracy of screening and assessment tools used to identify attachment patterns and attachment disorder. Quality assessments were conducted using the quality assessment of diagnostic accuracy studies – version 2. The review of 10-year outcomes (supplementary review 2) investigated the long-term impact of severe attachment problems using prospective studies with a follow-up of 10 years or more.

## Results

### *Supplementary review 1: validity of attachment assessment tools*

A total of 35 publications met the inclusion criteria for this phase of the review. The majority sought to validate an attachment assessment procedure under investigation against the SSP.

#### **Attachment pattern assessments**

In terms of test performance, two studies reported data that allowed concurrent validity calculation of sensitivity and specificity. When compared with the SSP in detecting secure attachment, the California Attachment Procedure reported a sensitivity of 0.90 [95% confidence interval (CI) 0.76 to 0.97] and a specificity of 0.30 (95% CI 0.11 to 0.54). The sensitivity of the Louisville Twin Study attachment procedure to detect secure attachment was 0.82 (95% CI 0.61 to 0.95) and the specificity was 0.66 (95% CI 0.29 to 0.92). A number of other instruments were compared with the reference standard (SSP), with a range of validity and reliability data reported.

The nomenclature for the SSP was varied. In 14 papers using this tool, 12 used variations of nomenclature or classification subtypes.

### Attachment disorder assessments

The Disturbances of Attachment Interview was compared with a semistructured interview to elicit RDC for attachment disorder. This found a sensitivity of 0.81 (95% CI 0.54 to 0.96) and a specificity of 0.86 (95% CI 0.78 to 0.92) for disinhibited attachment disorder, and a sensitivity of 0.80 (95% CI 0.28 to 0.99) and a specificity of 0.99 (95% CI 0.95 to 1.00) for inhibited attachment disorder.

When exploring the validity and reliability of all these assessments under consideration, only 5 of the 35 studies reported test–retest data. Inter-rater reliability was the most frequently reported type of reliability data. A total of 26 studies reported these data for the index tests and 23 studies for the reference test. Of these 26, 24 had good inter-rater reliability as defined by a level of 0.7 or above. Cronbach's alphas were reported in 12 studies for the index tests (in 11 studies  $\alpha > 0.7$ ) and four studies for the reference tests (in four studies  $\alpha > 0.7$ ).

The only study measuring attachment patterns and attachment disorders at the same time suggested that these are largely separate constructs.

### Supplementary review 2: 10-year outcome studies with an assessment of severe attachment problems at baseline

When we reviewed studies of 10-year follow-up where attachment had been measured at inception using either the SSP or a diagnosis of attachment disorder (WHO or APA), we found eight studies that reported long-term data in relation to severe attachment problems at baseline. Two of these studies measured the stability of attachment over time and two examined the relationship between severe attachment problems in infancy and later mental health problems. The remaining four studies met the criteria in terms of reporting 10-year outcomes or more and measuring severe attachment problems at inception, but did not report the outcomes of those with disorganised attachment separately. We found an association between severe attachment problems, and borderline personality disorder in young adulthood and psychopathology in adolescence. This information was generated for potential use in a health economics model that included 10-year outcomes and demonstrated a limited number of papers for this purpose. It is important to note that this does not include shorter-term outcomes than 10 years. These have been included in previous reviews.

### Main systematic review

In total, 30 studies were identified, 29 of which were delivering an intervention in a hypothesised 'at-risk' group to improve attachment patterns. The remaining study concerned treatment for children who already had a diagnosis of reactive attachment disorder.

### Interventions to modify attachment patterns

Within the clinical effectiveness review, 18 studies were identified that presented data comparing a parenting intervention with a control in a RCT. Only eight of these examined interventions to reduce disorganised attachment patterns (the subject of our review). Other studies sought to establish secure attachment patterns and a meta-analysis of these is included in an appendix of the full report (see *Appendix 6*).

Studies seeking to improve disorganised patterns of attachment ( $n = 8$ ) were combined and the pooled estimate gave a post-treatment effect of 0.47 (95% CI 0.34 to 0.65;  $p < 0.00001$ ). Most of these interventions include elements that sought to improve maternal sensitivity as a way to improve the child's attachment security.

### Interventions for children with attachment disorder

One study was found that met the criteria for this phase. This was an intervention for foster carers of children with an attachment disorder. Although this showed a modest improvement and reduced costs, the difference was non-significant.

### **Main systematic review (cost-effectiveness)**

Only two studies were found that ran an economic evaluation of a parenting intervention. Limited information was found to populate a decision model with any reasonable degree of certainty. We therefore performed provisional budget impact analysis based on the available evidence. A rating system that looked at the quantity and quality of evidence necessary to inform an economic model demonstrated that there were large gaps in the identified literature that would need to be filled to produce a robust economic model.

### **Implications for research**

In light of the results of our evidence synthesis, we found some promising research and a number of significant gaps in the literature that would be important to fill, in order to inform clinical practice and decision-makers.

There is good evidence that a disorganised attachment pattern identified through the SSP is a useful early-life measure to predict which infants in high-risk groups may have later psychopathology and require intervention. Many assessment tools have limited reliability and validity data, and further work in this area would be useful. The current evidence around diagnosis of attachment disorder is less clear, and the diagnostic systems are currently changing. Further outcome work would be helpful for this group.

The health economics analysis suggests that there is a need for further research to improve consensus on the definitions and assessments of attachment patterns and attachment disorders, to improve our understanding of the relationship between different assessments at different times and to gather more information about the long-term sequelae for different subpopulations. A cohort study would be appropriate for this work. This would support the development of fully powered RCTs to generate more robust clinical effectiveness research with high-quality resource utilisation and cost-effectiveness. One way to carry out this task would be to begin a new inception cohort with sequential measures of attachment and robust collection of risk factors and outcomes, and to use this large cohort to embed RCTs to carry out improved clinical effectiveness and cost-effectiveness work. Some of this work could also be established within existing cohorts.

### **Implications for practice**

With regard to parenting interventions, there is now good evidence to suggest that early parenting work focusing on maternal sensitivity is clinically effective, and that a range of programmes deliver this with or without video feedback. It is preferable in clinical practice to use an attachment assessment tool or diagnostic criteria that show good validity and reliability.

### **Study registration**

This study is registered as PROSPERO CRD42011001395.

### **Funding**

Funding for this study was provided by the HTA programme of the NIHR.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 5.116

*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/](http://www.publicationethics.org/)).

Editorial contact: [nhredit@southampton.ac.uk](mailto:nhredit@southampton.ac.uk)

The full HTA archive is freely available to view online at [www.journalslibrary.nihr.ac.uk/hta](http://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](http://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 10/45/04. The contractual start date was in October 2011. The draft report began editorial review in October 2013 and was accepted for publication in May 2014. 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 2015. This work was produced by Wright *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](http://www.journalslibrary.nihr.ac.uk)), produced by Prepress Projects Ltd, Perth, Scotland ([www.prepress-projects.co.uk](http://www.prepress-projects.co.uk)).

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

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

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

**Editorial contact:** [nihredit@southampton.ac.uk](mailto:nihredit@southampton.ac.uk)