

Prophylactic removal of impacted mandibular third molars: a systematic review and economic evaluation

Juliet Hounsome,^{1*} Gerlinde Pilkington,¹
James Mahon,² Angela Boland,¹ Sophie Beale,¹
Eleanor Kotas,¹ Tara Renton³ and Rumona Dickson¹

¹Liverpool Reviews and Implementation Group, University of Liverpool, Liverpool, UK

²Coldingham Analytical Services, Berwickshire, UK

³Oral Surgery, Dental Hospital, King's College London, London, UK

*Corresponding author Julieth@liv.ac.uk

Declared competing interests of authors: Tara Renton is a stakeholder for the National Institute for Health and Care Excellence appraisal associated with this publication.

Published June 2020

DOI: 10.3310/hta24300

Plain English summary

Prophylactic removal of impacted mandibular third molars

Health Technology Assessment 2020; Vol. 24: No. 30

DOI: 10.3310/hta24300

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

Plain English summary

Third molars, commonly known as wisdom teeth, may come through the gum (erupt) without any problems, usually during young adulthood (aged 18–24 years). However, in some cases they are unable to erupt because they are poorly aligned or obstructed by other teeth, gums or bone. They are then referred to as 'impacted'. Historically, dentists often recommended that these teeth be removed, so as not to cause problems later in life. This is referred to as 'prophylactic' removal. In 2000, the National Institute for Health and Care Excellence reviewed this practice and recommended that these teeth should not be removed if they are not bothersome to the person. Many dentists and oral surgeons have disagreed with this decision, believing that it is more difficult to remove these teeth later in life, and that there are more complications for the patient if they are removed later in life.

Our review group carried out a systematic review of the available clinical effectiveness and cost-effectiveness evidence of the prophylactic removal of impacted third molars.

The review identified four clinical studies, none of which provided strong evidence for or against the prophylactic removal of these teeth. These findings are similar to those of nine previous reviews. There is also very little research reported that relates to the cost-effectiveness of the procedure, with only three studies identified.

With the available evidence on the rates of extraction and the symptoms experienced by people who keep their impacted mandibular third molar, we built an exploratory economic model to assess the cost-effectiveness of recommending prophylactic removal compared with that of recommending watchful waiting. Results from the model suggested that a prophylactic removal strategy costs more than a watchful waiting strategy, but leads to improvements in quality of life. When the costs and quality-of-life measures that are associated with the two strategies are compared, the resulting statistic is £11,741 per quality-adjusted life-year gained, which would probably be good value for money for the NHS.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 3.819

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 15/69/16. The contractual start date was in April 2016. The draft report began editorial review in May 2017 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 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 Hounsme *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 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